

NOVEMBER 1993

# MacUser



## CD-ROMs

# Special Buyer's Guide to the Hottest Discs

## PowerPC — Can Your Mac Make the Upgrade?

# 5 Easy Fixes for Your PowerBook...Free!

# Databases You Can Set Up Yourself





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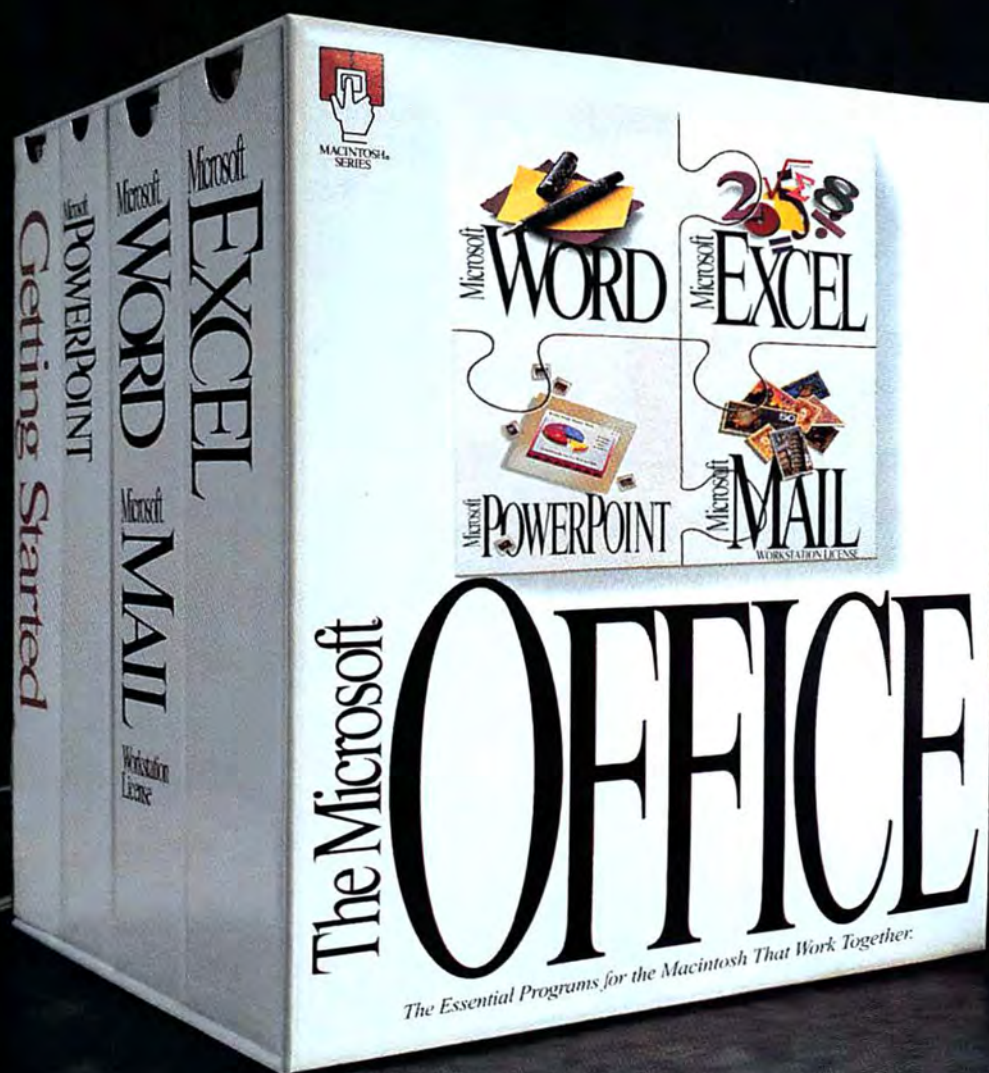
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From Subotnick's hummingbirds...



**90**  
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On the cover: *MacUser's* editors looked at hundreds of CD-ROMs before picking the 50 best.  
Cover photo by Fred Stimson

# MacUser

November 1993

Volume 9 Number 11

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By the editors of *MacUser*

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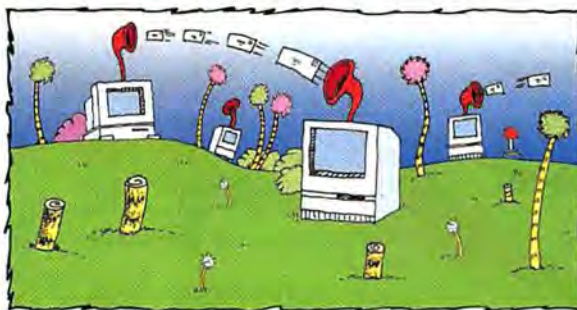
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About

# MacUser

## Smart CD-ROMs

**M**arshall McLuhan was the first to point out that a medium and its messages could easily become confused. Until now, the big news about CD-ROM was still the medium. Content took a back seat. Two years ago, when we looked at CD-ROM titles, we could find only 27 worth writing about.

Today, by contrast, just about every major player in the worlds of communications, computers, and entertainment — including Apple, Microsoft, IBM, Paramount, Sony, and Time-Warner — is investing in *title* development. Why, you ask? Because "smart TV" — where you interact with what you're watching — is just around the corner, and whoever has content for that audience stands to make lots of money. The first attempts at this new type of programming are represented in the current crop of CD-ROMs.



Assistant editor Amanda Michael looked at more than 200 CD-ROM titles while researching "The Top 50 CD-ROMs."

### The Next Generation

In contrast to the slim pickings of two years ago, we had an embarrassment of titles to choose from this time around, with new ones arriving almost every day. Many of them were surprisingly slick, artfully composed CD-ROMs that successfully integrated video, sound, text, and graphics.

So what makes a CD-ROM stand out?

"Obviously, speed, sound, and graphics are important," says assistant editor Amanda Michael, a contributor to this issue's CD-ROM roundup (see "The Top 50 CD-ROMs," page 90). "But the interface is the most important. The navigation tools have to get you where you want to go."

Amanda, who looked at more than 200 CD-ROMs in preparation for this article, has her favorites. "MovieSelect is really cool," she says, "and it was nearly 90 percent accurate in identifying movies I would like to see — but I really loved The San Diego Zoo Presents . . . The Animals!, which lets you see, hear, and almost touch over 200 animals in a very interactive format."

MacUser editor James Bradbury lobbied for his fave, A Hard Day's Night, as the top CD-ROM. According to Jim, A Hard Day's Night is a technical and artistic tour de force, containing nearly two hours of full-motion video. "Sure, the film window is still pretty small — but what really makes this product work is how the remaining screen space is used for supplementary material, like the original script. The use of photos and other video clips all help to document the context in which the movie was created."

The messages are getting better all the time.

— Nancy Groth



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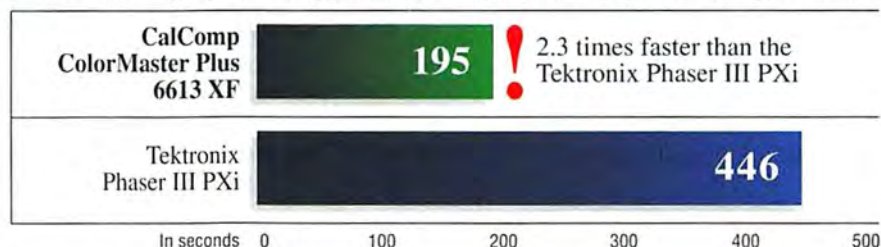
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# The future has to start somewhere.

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Here's why. Personal computers are on the verge of becoming infinitely more useful, more usable, more communicative and more mobile than they are today. A number of advanced technologies—real-time video, wireless networks, voice and handwriting recognition and object-oriented programming, among many others—are ripening, converging and becoming affordable all at once.

The one thing all those technologies need is extraordinary processing power. Processing power that only PowerPC Microprocessors can deliver.

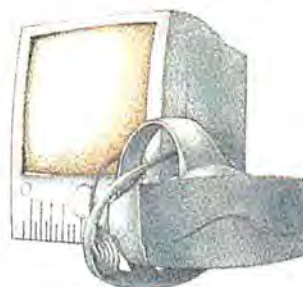
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MACWEEK  
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MACUSER  
SPAIN, 1992





## LETTERS

**A**re you ready for the Überdisk? David Carroll, of Brighton, Massachusetts, is. "Instead of external megadrives spawning like fungi, why can't Fuji or Maxell simply foil all these entrepreneurs by coming up with 100-megabyte or even 1-gigabyte floppies that work in the existing floppy drives?" he asks. We have to wonder about his comparison of this commonsense approach to the creation of the Volkswagen. Can "Fahrvergfloppy" be far behind?



Write to Letters to the Editor, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404, or post your letter on the *MacUser* Forum of ZiffNet/Mac, our on-line service. All



letters become the property of *MacUser*, and we reserve the right to edit any letters we print. Please include a return address and a daytime phone number.

### The Dynamic Duo

Henry Bortman's column "I Don't Want a Duo" (August '93, page 189) doesn't do the PowerBook Duo justice. It gives one man's opinion that his stubby fingers and need for bifocals made the Duo unsuitable for him. For professionals who spend most of their time in the office but also need to be mobile, the Duo is the best product.

I've been the happy user of a Duo 210 for four months. I look all day at Apple's color monitor, not the Duo's black-and-white screen. Then when I push the Eject button on the Duo Dock, I have everything with me — no need to bring along floppies or worry about whether I have the latest version of a file.

David Heyman  
via ZiffNet/Mac

I accept that some folks don't like the Duos. However, I expect the technical director of *MacUser* to at least get his facts straight. Henry Bortman's elaborate scenario of Duo-caused inconvenience is

based on an obvious error: "I have to shut down my machine" to attach a floppy adapter and floppy drive? Nope, sleep will do; there's no need to reboot and hence no inconvenient wait for all his nifty extensions to load.

Henry's cost comparison of the Duo 230 and the PowerBook 180 is similarly flawed. He includes no fewer than three separate Duo docks in the cost of a Duo. A MiniDock in each office and a floppy adapter for the road? Come on, Henry, get one MiniDock, and carry it with you. Even with the unnecessary expense of redundant docks, the Duo 230 was cheaper than the PowerBook 180 by "only" \$557 — a fair chunk of change to some of us. The \$3,500+ price tag of an all-in-one, active-matrix PowerBook 180 is beyond what we're willing to spend for a personal computer.

Duos aren't for everyone, but for some of us, they're just right.

James Huff  
Pasadena, CA

In Henry Bortman's attack on the PowerBook Duo, he gives fair treatment to the PowerBook 180 and extols its virtues (excellent screen, all-in-one design, multitude of modem options), but he doesn't give the same fair treatment to the Duo. He ignores the fact that the Duo's AC adapter is small and light and has a connection for a normal computer power cord, whereas the other PowerBooks have bulky, heavy adapters. More important, Henry makes no mention of battery life! Owners of 180s are happy if they can get two hours out of a single NiCad battery charge. On my Duo, I think something is wrong if I don't get more than three and a half hours.

As far as the modem options are concerned, I agree that the world of the PowerBook Duo leaves a great deal to be desired. I do question your editors' judgment in printing a column lambasting the Apple PowerBook Express Modem in the same issue in which it was a *MacUser*

### Open Folder

It's the little mysteries that make life in the Mac community so interesting, don't you think? For instance, there's the case of the disappearing Mac model. Doreen McMillan, of West Vancouver, British Columbia, wants to know why we don't mention the Mac IIvi in the pages of *MacUser*. Well, Apple decided to sell the IIvi in Canada and Europe but not in the United States, so it's a bit off our radar. The good news is that the differences between it and the IIvx, which is sold in the States, are minimal, so anything you read about the IIvx can be applied to the IIvi. The bad news is that recent comments about the IIvx have been about its impending demise. Was it Mr. Sculley in the library with the candlestick?

Bryan Dahlberg, of Denver, Colorado, uncovered another bit of intrigue in the pages of *MacUser*. "While perusing 'The Best Connections' in the July issue (page 218), I couldn't help but be captivated by the window behind the dialog box on page 221. Now I can't eat; I can't sleep; I can't even read Dvorak. I must know: Who is Desiree? Why is she on Air Force One? What is she doing with wax in the plushiest seat? The

slinky lounging outfit was from where? Whose frame was broodingly handsome? (Can a frame brood?) And finally, what did Desiree continue doing? Flicking? Ticking? Licking? Plucking?" Sorry, Bryan, you'll have to wait for Chapter XIII.

Finally, who would have guessed that the most pressing question in a Mac magazine would not be about PowerPC chips or PowerBook screens but about Gurgling Cods ("Dear Mr. Sculley," July '93, page 11, and Letters, August '93, page 20)? At last, we have Thomas Seibold to thank for the answer: "A Gurgling Cod is a novelty pitcher shaped like a codfish that's sold in the Boston area. It makes a gurgling sound when rocked and is used by Rush Limbaugh as a sound effect when referring to Democratic Senator Edward Kennedy's car accident at Chappaquiddick." Yikes! Another Rush reference sneaks in!

Got something on your mind? Here's a chance to get it off your chest. Write to Open Folder, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404. All the usual caveats about letters apply.





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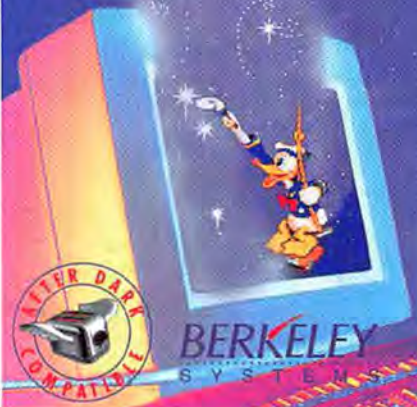


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## LETTERS

Bottom Line pick ("Working Away," August '93, page 102). Furthermore, that same article on V.32bis PowerBook modems claims that Global Village is not far from releasing a modem for the Duo. Henry doesn't seem to think so.

He misses the point about what the Duo is good for. There is no doubt that a Rolls-Royce is a wonderful automobile, but if I stated, "I don't want a Rolls" and went on to explain that this is because I can't drive it on unpaved mountain roads, nobody would take me seriously.

Ben Horwich  
Chicago, IL

I appreciate the correction about the floppy-disk drive. As for the Express Modem, it was chosen as a Bottom Line pick in a PowerBook-modem lab report because it was the only modem available for Duos. As for the comment about carrying a single MiniDock around, I believe James only amplified my point. If you have to carry around a MiniDock (and a floppy drive) wherever you go, what's the big advantage of a lightweight computer? Many people undoubtedly find the Duos worthwhile, despite their ugly screens, pea-sized trackballs, and problematic modems. I still don't want one. — HB

## Grayed Out?

SuperMac's large-screen gray-scale displays are alive and kicking the competition, but you wouldn't know it by reading *MacUser's* July issue. SuperMac was completely overlooked in your article on monochrome and gray-scale displays ("Silver Screens," page 130). To set the record straight, SuperMac has two award-winning gray-scale displays (the SuperMatch Platinum 20 Full-Page Display and Platinum 21 Two-Page Display) and a great monochrome graphics card — all at attractive prices. Please let your readers know that they can turn to SuperMac for the most-competitive products for their applications where a high-quality, large-screen gray-scale display is needed.

Christopher A. Kryzan  
General Manager  
High-Volume Products  
SuperMac Technology, Inc.  
Sunnyvale, CA

## Hooray for Hollywood

I read the novel *Jurassic Park*, by Michael Crichton, and loved it. I found the movie to be equally wonderful. I was interested to see that Mac Quadras with SuperMac monitors were used in the control room to run the park and that the camera focused on the company logos. Because Macs were never mentioned in the novel, I wonder what Apple and SuperMac had to do to have the privilege of running Jurassic Park. I'm certain it was well worth it.

Marc LaFountain  
Columbia, SC

## Why did Sharon Stone's character in *Sliver* just turn on the Duo Dock without showing the machine's capabilities?

I recently saw the movie *Sliver* and noticed one of the worst uses of a prop I've seen in a long time. Why is it that Sharon Stone's character walked into her office each morning and simply turned on the conspicuous Duo Dock on her desk?

Apple must have been so intent on having a product-placement ad that it didn't bother to get the moviemakers to fully show the machine's capabilities. Apple should demand a refund!

Brian E. Hunter  
Hanover, NH

We asked Jerry Seinfeld's *Classic* for the inside scoop on the Mac's inroads into Tinseltown, but it was busy doing lunch at Spago with Demi Moore's *PowerBook*. — PP

## StyleDeskWriter Pro II

I can't let pass your comparison of the Apple StyleWriter II and the Hewlett-Packard DeskWriter (July '93, page 73). I was disappointed to see in the table of contents that the new Apple StyleWriter II "is still no match for the HP DeskWriter." But in reading the review, I discovered that the StyleWriter prints text better than and as fast as the DeskWriter — and it's cheaper too. That's great news for me and a lot of other folks who do not use networks or print gray-scale graphics. I just want better print quality than the ImageWriter's.

In fact it's hard to conceive why someone with a large and expensive system or network would find either the StyleWriter or the DeskWriter of much interest. These folks have the resources to buy laser printers with better gray-scale printing







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## LETTERS

and faster speed. So why are you evaluating these two printers as if they were the mainstay of every local-area network?

Bill Eppick  
Portland, OR

*Our discussion of StyleWriter II networking was a must — even though we deemed it detrimental to host-machine performance — because it is a major aspect of the printer's most important new feature, the GrayShare software. Our main points in judging the StyleWriter II inferior to the DeskWriter were gray-scale quality and speed, hardly obscure criteria to most printer buyers. — SJ*

Your StyleWriter II review indicated that buyers of the original printer could use the new software with the original StyleWriter to enhance the printer's output. Being interested, I called Apple and was told that Apple did not recommend using the new printer software with the original printer.

Earl H. Gibson  
Wynnewood, OK

*As we were going to press with the StyleWriter II review, Apple informed us that the printer's new software would work with the old StyleWriter. The company has since changed its mind. Based on our experience with the new-software/old-StyleWriter combination (sometimes it works, sometimes it doesn't), we think Apple has the right mind-set. — SJ*

### Aquarium IIx

I just read Michael Swaine's August column ("Too Many Macs!" page 37). I prepared a long, sarcastic response, but I changed my mind about sending it. Instead, I'll offer \$100 for any obsolete Mac IIx for which he or Andy Ihnatko can find no use other than as a fishbowl. This is a serious offer. If they are so clueless as to believe that IIx Macs have no further use, I might as well be the one to take advantage of that foolishness.

Jim Bailey  
Acton, MA

I've been reading Michael Swaine's columns in *MacUser* for years, but his August column has finally inspired a reaction. I take exception to his statements on "obsolete" Macs: "Maybe I should

explain why Apple *had* to institute a policy of accelerating planned obsolescence" and "Although forcing users to upgrade their Macs . . ." Michael: Excuse me? Perhaps you're referring to my original 128K \$2,500 Mac (upgraded to a Plus in 1986), which still runs the vast majority of available software? Do you mean I can throw away the Mac I bought last year because the price of the Quadra 950 has just been cut? The closest I've

seen to a forced upgrade was the step up to 128K ROMs.

Prices will always go down; power will always go up. To baldly state that existing Macs are obsolete is misleading and perhaps even malicious. The truth is that any Mac bought today will be useful far into the future, running the latest software. Even

the PowerPC will not render the existing Mac base obsolete for a long time.

Mark A. Chaffin  
via ZiffNet Mac  
*Absolutely right. A product can be made obsolete without being any less useful to those who've already bought it. Hey, the fishbowl bit was a joke. — MS*

### Fess Up, Andy

Well, now that Andy Ihnatko has thrown the fear of low-cost goods into our hearts ("Dollars and Sense," August '93, page 29), why not tell us about all the low-cost stuff he uncovered? He says, "... all but three of [the modems] gave up the ghost after ten hours . . ." Which three? Come on, there was no useful information in this polemic at all, except maybe for the fact that MacProducts is, in its own twisted way, honest. I can think of two reasons why he didn't name names: It would upset some advertisers, and he was trying to lecture, not to pass along useful info. The first will be denied, but if the second was the reason, then why the heck was the column printed? Isn't this magazine supposed to give us useful information?

Manuel Veloso  
via ZiffNet/Mac

*Not to be pushy or anything, but I might gently offer a third reason as to why I didn't name names: Two of the modems that did the big firework are no longer being made. A fourth is that it*



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**"Computer, display Macintosh on TV."**

*You can play video right on your AV computer monitor for easy presentations to coworkers, clients or a class. You can also plug either machine into a TV, if you need a larger display. Or plug into a VCR, and record your work on videotape for distribution.*

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video source, and open a file by saying, "Computer, open."

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# In fact, they'll do just about:

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## LETTERS

seemed to me that my testing of those modems was hardly scientific; I would never commit to a blanket "this modem sucks" statement unless I'd tried many of the units and found uniform failure. But the fifth reason is the true one: The purpose of that section was not to warn people about modems A, B, and C but to say that based on my experience and the experience of others, entry-level modems as a class have a tendency to develop problems in harsh conditions. — AI

### Stuff This

In response to "Shrink Your Files" (July '93, page 242), I don't think Mark Simmons is telling the whole story behind Aladdin Systems' StuffIt and Bill Goodman's Compact Pro. He's correct that StuffIt Lite often cuts files as much as 5 percent more than Compact Pro. But he doesn't mention that Compact Pro can routinely compress files more than 25 percent faster than StuffIt or that its interface is far less cluttered. He doesn't mention Aladdin's irritating habit of changing StuffIt's archive format every few months, which forces users to download a 450K update — a file that's roughly four times the download size of Compact Pro (translating to about \$3 more at 2,400 bps on CompuServe) and that occupies more than three times the space on the user's hard disk. Compact Pro users, on the other hand, have not needed to download an upgrade yet.

A compression program is more than just the resulting file size: When a utility's primary function is to create files to send over a modem, file compatibility and speed need to be taken into account. Compact Pro has StuffIt beaten on both counts.

Garner Miller  
The Macintosh Network BBS  
Palm Bay, FL

When choosing a file format for uploading and downloading, compression or decompression speed isn't relevant. The overriding concern is how long it takes to transmit the file (hence the file size), because you're paying for that time (in connect-time charges, phone bills, or both). It's true that Compact Pro got its file format right the first time, but I'm glad Aladdin dumped its old, inefficient format. By the way, StuffIt's format has changed all of twice, and the last change was about two years ago. Even so, a user who needs to get at new-format StuffIt archives can do so with Aladdin's free StuffIt Expander utility, which is a much

smaller download than the 450K UnStuffIt package. We recommend that all telecom mavens have this utility on hand for decompressing Compact Pro archives as well as StuffIt ones. — MS

### Game Over, Man

As a recent buyer of a CD-ROM drive, I have sampled the new generation of CD-ROM-based entertainment software. In general, the graphics and video are nothing less than stunning, the sounds and music sensational, and the interfaces intuitive; the vendors have forgotten only one thing — the games! You would think that somewhere among the 150 megabytes of data, they could include at least 1 megabyte of gaming. Of the games I purchased, all were linear, simplistic, and trite. Are CD-ROMs really the "next generation" of computer gaming, or are they a forum for multimedia extravaganzas, designed to be brainlessly watched and not played?

Dave Aaronson  
Columbus, NJ

Ask, and you shall receive. Take a look at "The Top 50 CD-ROMs," in this issue. — PP

### Corrections

In the August story on PowerBook modems ("Working Away," page 102), we said that none of the modems tested fits into the PowerBook 100. This is incorrect. With the exception of the Applied Engineering DataLink PB, they all do. Also, contrary to the features table on page 116, the APS Modem 14.4 does not have an OCR option.

The phone number for Advanced Imaging (now called FITS Imaging), which makes Live Picture software (Desktop Publishing, August '93, page 147), has been changed. For more information about Live Picture, call HSC Software, at 310-392-8441.

The phone number listed for Microlytics (Personal Macintosh, August '93, page 183) is wrong. The correct number is 716-248-9150.

In Power Tools (August '93, page 197), two phone numbers were listed incorrectly. The phone number for Digital Eclipse should be 510-547-6101, and the number for Lincoln Software should be 617-259-4135.

In "Real NetWare for Macs" (August '93, page 177), we stated that FileMaker Pro 2.0 supports IPX. The correct version is FileMaker Pro 2.1.

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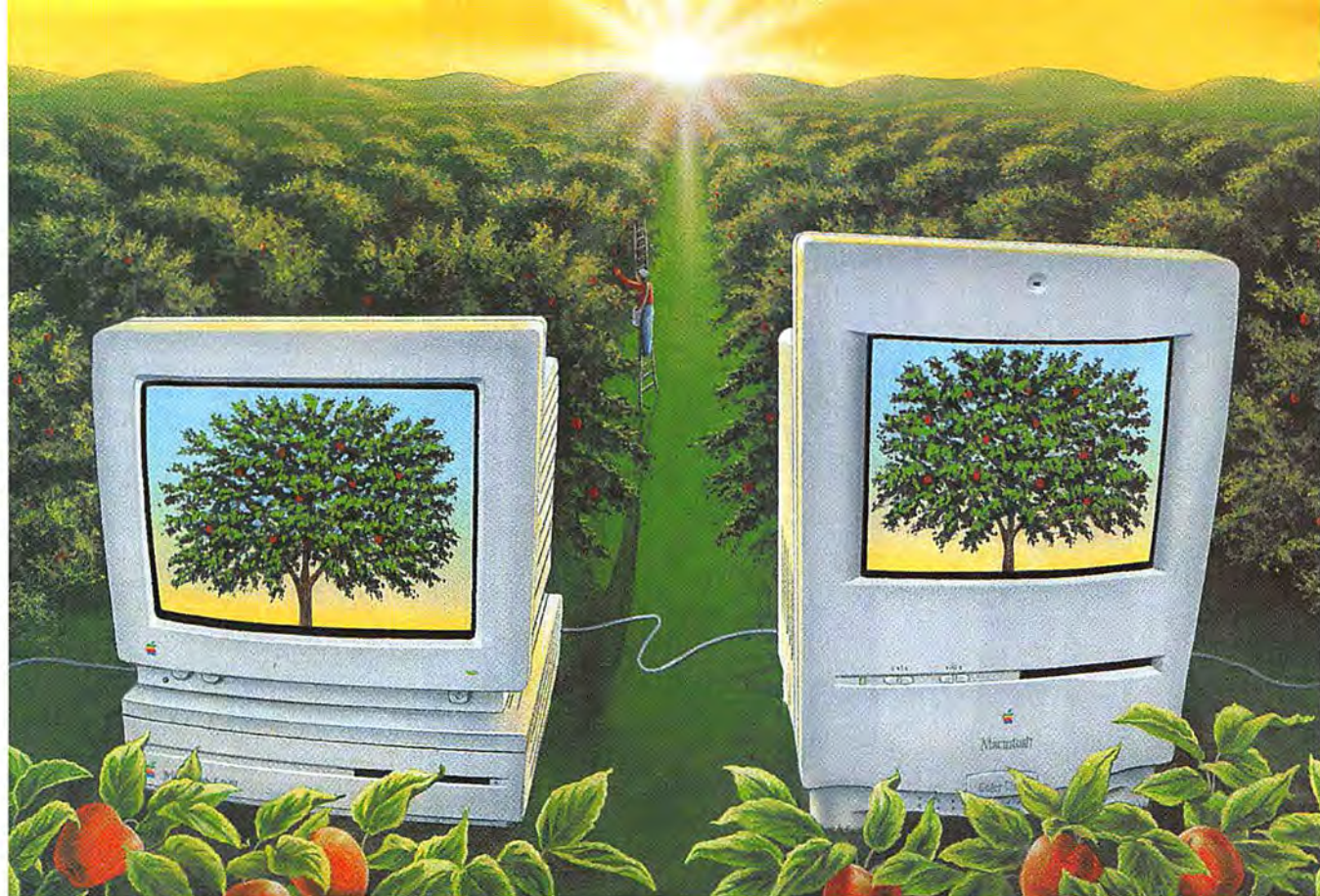
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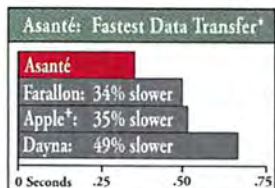
**CIRCLE 43 ON READER SERVICE CARD.**





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\*32K file transfer between a Quadra 950 and Quadra 700. Source: Recommended Test Labs, Inc. 1993. Call Asanté for complete report.

Introducing the MacCon+<sup>™</sup> LC III Ethernet adapter for the brand new Macintosh<sup>®</sup> LC III and Color Classic. It's a high-performance card that plugs into the LC III's 32-bit expansion slot for simple Thin and 10BaseT Ethernet connectivity. This adapter is also backward compatible with earlier models in the LC family, and the Performa 400.

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Mac LC III	MacCon+ LC III
Centris 610 & 650 Quadra 800	FriendlyNet Media Adapters

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**CIRCLE 86 ON READER SERVICE CARD.**



# Soul of a New Workplace

I've seen the future, and it's my husband. Until recently, we were your average DIMIT (double income, more taxes) couple, trying to get ahead in Silicon Valley. We rolled out of bed, brewed some decaf cappuccino, got dressed (he in a suit and I in whatever wasn't at the dry cleaner), kissed the cats goodbye, and spent the next 30 minutes driving 12 miles to our respective industrial complexes. There, we spent the rest of our day going to meetings; talking on the telephone; going to more meetings; and, of course, banging on our Macs. Well, those days are gone — at least for Jeff.

The future arrived last year, when another company merged with my husband's and he wasn't keen on the new world order. As luck would have it, a small software startup approached him about launching its West Coast sales operations. Being a startup, the company couldn't afford to open an office just for him, and he wasn't willing to move to its Cleveland, Ohio, headquarters — which is why, a few months ago, Jeff set up a couple of Macs and a Sun SPARCstation and began to run the West Coast operations from the back room of our house. (I was initially very skeptical of this plan, but read on.)

## How It Works

The company headquarters is Sun- and Mac-based. The Sun SPARCstations are used for engineering development. The Macs handle finance, presentations, marketing, word processing, and whatever else crops up. The Macs and Sun workstations are networked, and they use the Internet for communicating with the remote site (exchanging files with the "California Sun"), customers, and vendors and for the usual e-mail chitchat.

Now for the California setup. On one side of Jeff's desk (which faces our backyard and has a decidedly better view than any cubicle I've ever seen) is my old Mac IIx, which has been resuscitated with extra RAM to serve as his office computer and fax machine. Because he spends a lot of time on the road,



**The future of business computing may include a view of your own backyard.**

the company bought him a PowerBook 165 (which, of course, immediately went down in price). He uses it for presentations, communications, and general productivity. Hanging off the other side of the desk is the Sun SPARCstation, which runs the UNIX-based software he's selling. No doubt the advent of PowerPC products will alter this desktop landscape considerably.

The remote setup has worked remarkably well. Now that he's dealt with a few initial challenges — such as getting the Mac IIx to receive faxes, give him access to them when he's on the road, and receive files from SPARCstations — you'd never know that he wasn't sitting right next to his colleagues in Cleveland.

My initial skepticism stemmed from a variety of reasons, most of which were personal, not technological. As someone who travels frequently, I'm used to working remotely, so I wasn't particularly concerned about his ability to communicate with headquarters. I did worry,

though, that he might miss the companionship of coworkers. And I have to admit I was also afraid that having him around the house all day meant the place would be a wreck by the time I got home.

None of my fears have been realized. He's incredibly motivated, he's less stressed, and he gets more done. While I'm racing around getting ready for work, he's already read the business section and called the office. He's more productive, because he's not wasting time commuting or attending endless meetings. We save money on dry cleaning and gas. Even the environment benefits. Best of all, when he needs a break, he unloads the dishwasher. I hope he never goes back to work in an office!

## Home Alone

At present, Jeff's still an exception; most people who work out of home offices do so only one or two days a week. Estimates I've seen of how many people are choosing to work at home vary from 5 to 7.5 million. (Just over half of them have computers.) All the statistics, though, show that the number is increasing every year, as more companies realize that employee productivity and effectiveness don't disappear as soon as you step outside the company doors.

There's another reason, though, why I expect this trend to continue gathering steam. With a seemingly endless number of workers being jettisoned from corporations (living in Silicon Valley, I know more of them personally than I care to count) and with precious few companies creating new jobs, more people will have to forge their own opportunities. For many, these new opportunities will be based in home offices instead of traditional office parks. The synergy of technology and communications represented by products such as PowerBooks and PDAs is enabling this fundamental shift, and it will change forever our definition of what a workplace is.

And if that means I can come home to a more relaxed spouse and a cleaner house, I'm all for it. ☺



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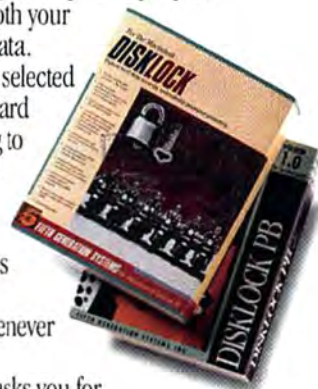
You don't even have to be there. DiskLock automatically blanks your screen and secures your system for you—without interrupting applications—whenever you wander off.

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Dear Kate Letter

July 22, 1993

Dearest Ellen:

If there is anything better than being loved by you...it is loving you.

And you are so easy to love. You've brought such wonder into my life and have touched my heart with your love.

I just want you to know, my darling, that it feels so good being in love with you and I want to love you for a very long time.

You are a wonderful woman and I love you dearly. If I'm dreaming, please don't wake me up—I don't want this to end.

Monogamously yours,

PERSONAL

Normal

FROM: Scott (7/30/93)

TO: Chris

CC:

BCC:

Subject: PERSONAL

Time: 1:24 PM

Date: 7/30/93

OFFICE MEMO

During a recent dinner at Chairman Binkenheimer's home, you stated that members of the Daughters of the American Revolution are "a bunch of old battle-axes."

Judging from the fact that you made this comment within earshot of the Chairman, you must not be aware that Mrs. B. is a founding member of the local D.A.R. chapter and holds the rank of Brigadier General.

Employee Evaluation

EMPLOYEE EVALUATION

EMPLOYEE NAME	EMPLOYEE #	DEPARTMENT
ANTHONY HALSTEIN	228	Administration

PERFORMANCE OF RESPONSIBILITIES:

Mr. Halstein distinguished himself as a most capable administrator. For some Mr. Halstein's duties, that was considered a major

INTRA-OFFICE RELATIONS:

Mr. Halstein distinguished himself as a most capable administrator. For some Mr. Halstein's duties, that was considered a major

CHARACTER ISSUES:

Mr. Halstein distinguished himself as a most capable administrator. For some Mr. Halstein's duties, that was considered a major

OTHER COMMENTS:

Mr. Halstein distinguished himself as a most capable administrator. For some Mr. Halstein's duties, that was considered a major

RECOMMENDATIONS:

Mr. Halstein distinguished himself as a most capable administrator. For some Mr. Halstein's duties, that was considered a major

RESUME

CHRISTOPHER S. KEENAN

Chris Party Leader

I got a new job.  
LET'S PARTY!

Date: November 3

Time: 2PM

Place: Chris' Place  
123 Unemployment Lane  
555-1232

ISSY

And remember, don't tell anyone else at the office!!!



# Cheap Health Insurance



**Lots of companies sell ergonomic products for your Mac, but the best solutions are free.**

**M**ankind's relationship with computers has always been sadomasochistic at best. We alternate cursing at them with pathetic pleading for more of the abuse that only our platinum partners can dish out. It's a sick relationship but a fruitful one. That's because no matter what epithets we scream, the worst a computer can dish out in return is a power cord looping around our legs and pulling us down with it (à la Wile E. Coyote) after we inevitably elect to heave it off a tall building.

But as everyone now knows, computers have had a more sinister and cunning plan all along. If the more lurid news reports can be believed, longtime computer use leads to crippling hand injuries, blindness, and exposure to deadly radiation. Sure, as a result, some of us will receive awesome superpowers, but what if you're not one of the lucky few?

It's prudent to be concerned about the various health risks associated with computer use, but before you spend dough on products that promise to keep you safe, realize that the marketing of this product might be more scientifically devised than the product itself. Believe it or not, almost all effective solutions to potential computer-related health problems are absolutely free.

## Hands

Try setting a pencil lengthwise on top of your wrist while your hands are at the keyboard. Does it touch skin from end to end? No? OK, let's all say it together: "repetitive-stress injury." Some of you probably chanted "carpal-tunnel syndrome," but we're talking about the same thing: damage to nerves and tendons in your hands from excessive typing and mousing. At best, an RSI is nothing more than mild tingling or numbness. At worst, an RSI sufferer is saddled by a high degree of pain and impairment correctable only by costly surgery. And because people who make their living with computers are as paranoid as concert pianists about their hands, no end of braces, guards, pads, and other aids have been designed to protect against RSI.

Probably the most ubiquitous anti-RSI aid is the humble wrist rest, which many users slip under or in front of their keyboards. These are fine, unless you use them in the manner demonstrated by many salespeople, with wrists planted on the pad while you type. As you can guess, this only makes the compression problem worse. A wrist rest is a

place for you to *rest* your wrists when you pause in typing, as an alternative to cocking your wrists on the hard edge of a desk or keyboard.

A sexier anti-RSI weapon is the Michael Jackson-type wrist brace, which supports your wrist and hand and makes it difficult to bend them out of straight alignment. Properly designed and used, braces work great. However, many people are making the colossal mistake of going to their local drugstore and buying wrist braces designed for wrist injuries. Many of these have a rigid support which keeps the wrist flexed upward, which is *precisely* the sort of position you want to avoid; in New York City, I spotted a computer store actually selling such braces specifically for the treatment of RSI.

You're also not necessarily in great shape with a properly designed brace either. Buy one that's too small or strap it on too tightly, and you may actually *accelerate* nerve and tendon damage. For this and many other reasons, if you suspect that your hands are giving you trouble, it's very important that you see a doctor *toot sweet*. I know that's what everyone tells you, but this time it's the straight dope. RSI problems that are diagnosed and treated at the early stage can easily be solved with some fairly simple behavior modification or with proper braces your doctor shows you how to use correctly. But if you wait until you wake up one morning to discover that your hands no longer work, you'll be resigned to a date with the knife, a lifetime of pain and impairment, or both.

Above all, *rest, rest, rest*. The biggest cause of typing-related disorders is the repetition of the same motions over and over again without relief. Every hour, on the hour, take 5, 10, even 20 minutes to do something else and stretch a bit. This and the preceding measures cost absolutely nothing — and they work.

## Eyeballs

There's no evidence that staring at a computer monitor causes any permanent damage to the eyes; the American Academy of Ophthalmology itself has given computer screens a clean bill of health. But computer screens can certainly cause eyestrain and temporary vision problems. Most problems can be directly attributed to the lighting around your computer; almost everyone knows that glare and reflections from a computer screen ain't



good, but it's also important to have subdued, even lighting in the office. Special tinted eyeglasses or antiglare screens can alleviate glare, but removing the source of the glare is far more effective (and infinitely cheaper). Just kill the over-

head lights and any intense desk lamps in the room, and if you have to have your computer next to a window, try to jockey things so that the plane of the screen is perpendicular to the window. In general, an underlit room with a simple task lamp

for reading papers is your best bet.

If you can't control the lighting, tints and antiglare screens are better than nothing. Many one-hour eyeglass shops can apply a 15-to-20-percent tint for free, but an antiglare screen is generally more effective. Make sure it's designed specifically for your screen size, and give a lot of thought to investing in a glass polarizing filter instead of a cheaper cloth screen. Cloth screens have to be cleaned of dust (with uneven success), and many people find they blur the display.

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**CIRCLE 77 ON READER SERVICE CARD.**

**Nothing inspires panic  
quite like the word  
radiation, and the  
knowledge that all  
CRT-based video  
monitors leak ELF  
and VLF radiation is  
hardly comforting.**

And yup, there's preventive medicine for eyestrain too. Try to focus on distant objects occasionally as you work. This prevents some of the fatigue you suffer when your eye muscles have to hold focus in one spot for a long time. Also consider simply turning your monitor's brightness down a bit; it's so simple you might not think of it, but it helps a lot. Oh, and do remember to blink. Dry, painful eyes are usually a side effect of the tendency to blink less while staring at a screen, so keep those orbs moist.

### The Big R

I've saved the scariest part for last. Nothing inspires panic quite like the word *radiation*, and the knowledge that all CRT-based video monitors leak ELF and VLF (extremely low frequency and very low frequency) radiation is hardly comforting. Many companies have come out with special radiation-shielding kits that purport to reduce such emissions to "safe" levels, but the chief thing to remember is that no one has any genuine idea of what a safe level of low-frequency radiation is. Numerous studies have been done on the subject, but no real consensus has been reached yet. I don't want to alarm you unnecessarily, but it should be pointed out that although such shielding does reduce radiation dramatically, any



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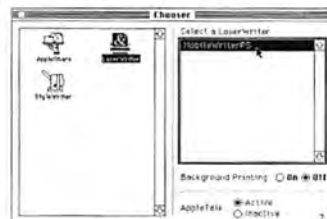
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**CIRCLE 52 ON READER SERVICE CARD.**



promises of safety are conjecture; the only 100-percent safe monitors are the ones based on LCD technology (in other words, buy a PowerBook).

For the most part, there's not much to worry about with monitors manufactured

in the past two years. In 1990, the Swedes drafted an exhaustive specification for reduced-radiation monitors, and as compliance is pretty inexpensive, almost all modern monitors are as safe as they can reasonably be. Just ask the manufacturer


if a monitor is MPR II-compliant (if they don't know what that is, apologize and ask if it emits less than 250 nT of electromagnetic radiation sampled at a distance of one-half meter). But let's say you have an older monitor; do you still have cause for concern? Well, as a purely practical matter, no; the strength of the radiation decreases in proportion to the square of your distance away from the monitor, so most experts claim that if you stay at least one arm's length away, you're as safe as you're going to be.

**Safety is far iffier if you work in a maze of office cubes where your head is only a couple feet away from the back or sides of a coworker's monitor.**

Safety is far iffier if you work in a maze of office cubes where your head is only a couple feet away from the back or sides of a coworker's monitor; on non-MPR II-compliant monitors, radiation emanating from these places is far stronger and as such carries far greater risk.

#### So Lovely, So Deadly

As in all segments of the marketplace, the freaks and the charlatans are out there. But if you do decide you need to go out and spend some money, make sure you try any health-related product before buying it. Some are uncomfortable, some are cumbersome and don't fit your lifestyle, and some just plain don't work.

In all the cases mentioned here, the healthiest solutions are simply based on eliminating unhealthy habits. Look at me. I've been computing healthily for years without even knowing it. The TV in my office is 20 feet away from my desk, so I'm constantly shifting my focus; I wear black T-shirts and generally work at night, so glare isn't a problem; I sit far back from my monitor; and best of all, I spend enough time pacing the floor, reading comic books, and listening to loud music searching for *le mot juste* that problems caused by long periods of uninterrupted work are dang near impossible. My columns are generally upwards of three weeks late, but hey, this is my *health* we're talking about. 

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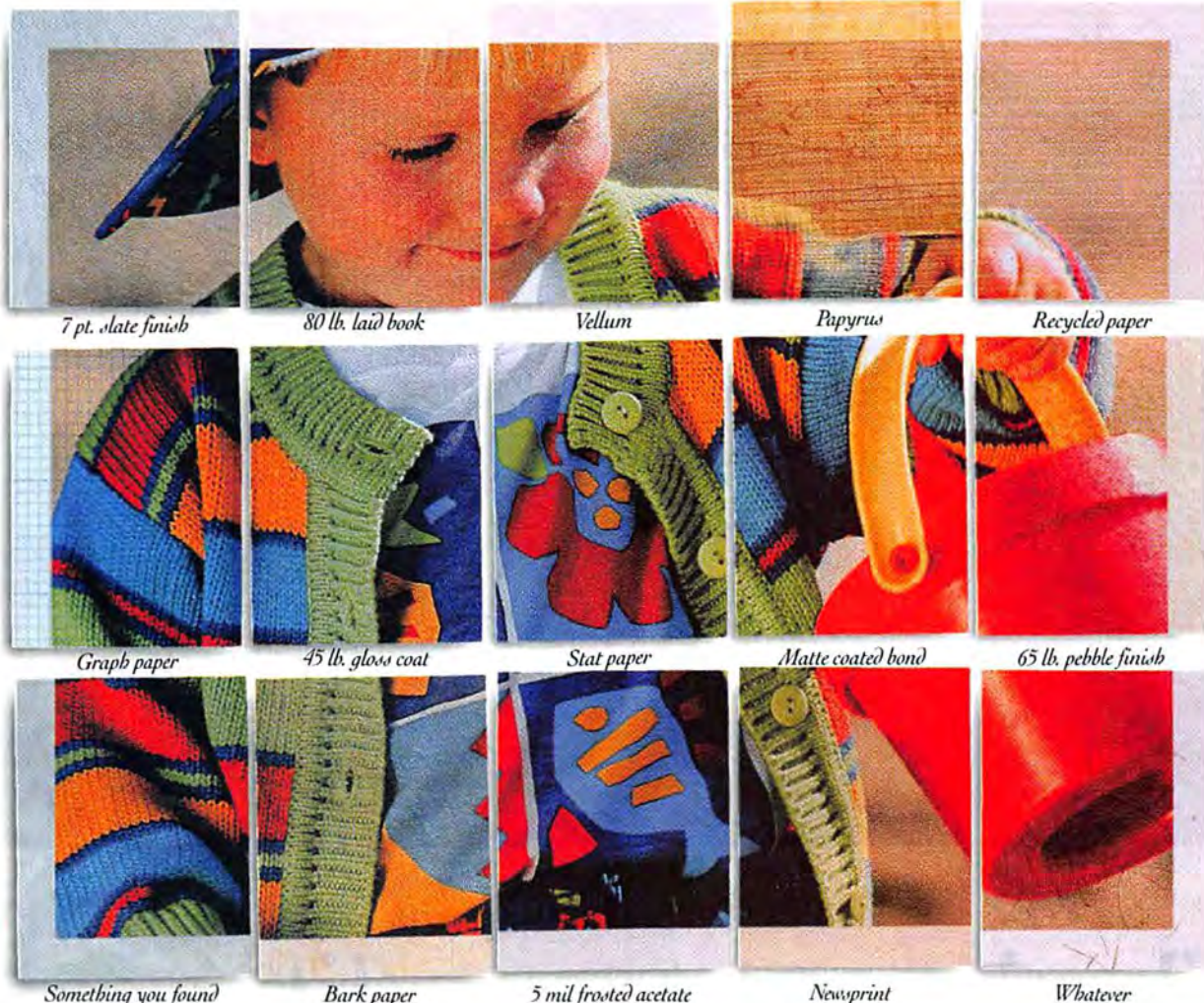


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CIRCLE 75 ON READER SERVICE CARD.





## Like most color printers, this one works best if you use the right paper.



*Works great on plain old white, too.*

Color printing on plain paper is, no doubt about it, a remarkable achievement. But we know there are times when you wish you weren't limited to an 8½" x 11" white piece of paper. You know, those times when you need a Phaser™ III color printer.

From vellum to card stock, newsprint to acetate, the Phaser III prints on almost any stock you'll ever need. In any size you wish, from 4" x 6" to 12" x 18" full bleeds. That way, you can do your comps on the paper you're ultimately going to use. After all, what you print on is just as important as what you print.

To make sure you always look good on any paper, the Phaser III features Adobe PostScript™ Level 2 (the latest version), 300 dpi, PANTONE®\* certification, and a 24MHz

RISC processor to keep your work humming. It also connects nicely to PCs, Macs or workstations. Or all three at once. Above all, it gives you 16.7 million of the brightest, most saturated colors ever printed on the desktop. No wonder it's won more industry awards for excellence than any other printer.

With the Phaser III, you'll always have the right paper. You'll have the right printer, too.

Call 800/835-6100, Dept. 30-A for a free output sample. If



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**CIRCLE 18 ON READER SERVICE CARD.**



# What's a company like us do

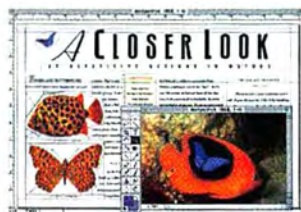


What could Intel, the leading manufacturer of PC microprocessors, have to say to a Macintosh™ user?

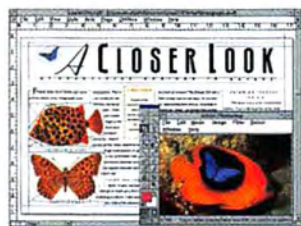
Surprisingly, a lot. Especially if you're one of the growing number of Mac

users looking for software compatibility and better price/performance.

At Intel, we know computer users can get pretty attached to their software—you'd prefer to keep using it even if you buy a new PC. That's why we've always made sure our PC processors run yesterday's PC software as well as the latest releases. And today, more software developers are writing new programs for



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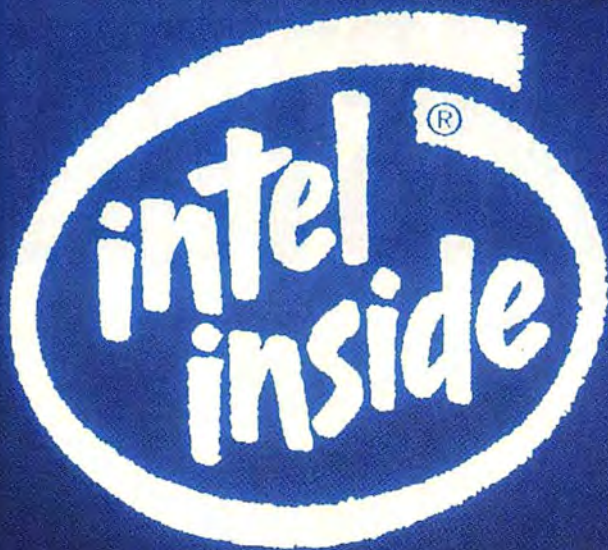
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# ing in a magazine like this?

more for your money than Macintosh can. That's because hundreds of companies worldwide bring you computers based on Intel's processor technology.

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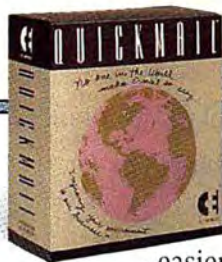
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# AppleScript Adjustments



**The new scripting technology from Apple promises a lot to ordinary users — but does it really deliver?**

**N**ow that Apple has delivered AppleScript, its system-level scripting technology, it's time to ask how many lies have been told about it.

**Answer:** Surprisingly few, although some of the claims need a little adjusting.

**Claim:** With AppleScript, you just give your Mac a list of things you want it to do and it does everything on your list.

**Adjustment:** These "lists" are, in fact, scripts, which is to say programs. As you might guess, you can't write programs in AppleScript without expending some serious effort learning the language. Which, unless you're the kind of propellerhead who dials the phone by using a HyperTalk script, you won't.

**Claim:** You can create a script simply by turning on the AppleScript recorder and performing a series of actions. AppleScript will save your actions as a script, which will repeat those actions whenever you run it.

**Adjustment:** That simple picture may work for very simple scripts. In fact, you can record truly humongous sequences of actions and AppleScript will flawlessly record them as syntactically correct scripts. But you can't use recording to create scripts that take different paths depending on circumstances, that repeat actions as many times as needed, or that test and report on conditions. Worse, you can't really count on big scripts to do exactly what you had in mind unless you know something about the language, which is precisely what you thought you were avoiding with this recording business.

**Claim:** There will be many ways to access scripts without writing or even recording them: through QuickKeys macros, menu items in supporting applications, scripts saved as script apps and distributed through on-line services and user groups, and the propellerhead in the next cubicle.

**Adjustment:** No adjustment necessary.

**Claim:** AppleScript will let you drive applications to do things they otherwise couldn't do. Tell your word processor to remove line numbers from certain kinds of documents or italicize all words containing foreign characters such as *ñ*. Tell your graphics program to render a file of complex graphics overnight. Launch your page-layout program every morning, and tell it to check your e-mail in box and use any documents it finds there to produce a morning paper for you.

**Adjustment:** That is, if you have the new,

AppleScript-friendly version of the applications. Many applications already support AppleScript, but many don't and probably some never will. Then there are levels of support: Some applications will be scriptable but not recordable, for example. Read the fine print on the box.

**Claim:** You can use AppleScript to combine the capabilities of application programs, using a spreadsheet program and a word processor to produce an accurate and attractive invoice, for instance.


**Adjustment:** Passing lightly over the concept of an attractive invoice, if the probability of one program you want to use being AppleScript-friendly is  $1/n$ , then the probability that two applications are is  $1/n^2$ . And although AppleScript does work over networks, don't plan to use programs remotely unless you know they will be open when you need them, because AppleScript can't launch an application on another machine.

**Claim:** You can use AppleScript to drive the Finder, with scripts that alert you when e-mail comes in, back up selected folders at preset times, or gather related files into a project folder.

**Adjustment:** You can do each of those things, because AppleScript comes with system extensions that add specific AppleScript capabilities to the Finder. For example, you can write a script that displays a dialog box because there is a *display dialog* system extension. But don't assume that whatever the Finder can do can be scripted. The Finder is not (yet) an AppleScript-friendly application. And you won't be creating Finder scripts by recording mouse clicks and menu choices. The Finder is not recordable.

## Post Scripts

I believe that AppleScript is really part of a new model of computer use. One aspect of this new model is demand functionality: Instead of trying to anticipate everything you might ever want your word processor to do when you buy it, you add features as you need them. Being able to customize your software to your needs is desirable — but AppleScript can't make it happen unless it gets a bit of assistance from a scriptable Finder; a more object-oriented operating system; and smaller, more focused, scriptable applications.

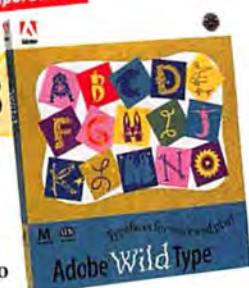
And scripts. Lots of scripts. Propellerheads, take note. 



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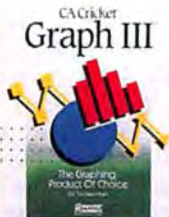
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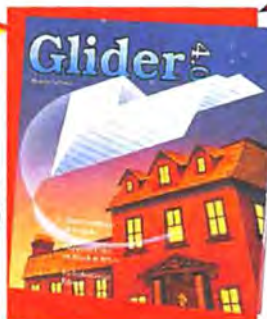
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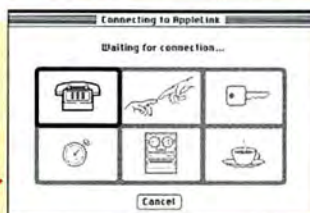
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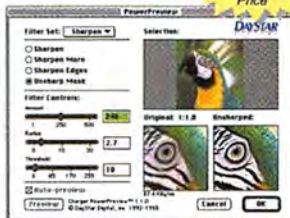
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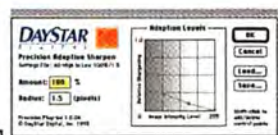
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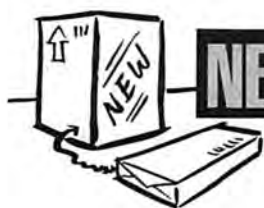
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## NEW ON THE MENU

Monochrome, 600-dpi laser printers are becoming the standard in business printing, and ever since Hewlett-Packard introduced the LaserJet 4M, their prices have been dropping. The two latest entrants, from Texas Instruments and NEC Technologies, push the price down even further, to less than \$1,600.

The **microLaser Pro 600** (\$1,599), from Texas Instruments (800-336-5236 or 214-995-2011), comes packed with features. An 8-ppm, PostScript Level 2 model, it uses a 20-megahertz IDT RISC processor and comes with 6 megabytes of RAM (expandable to 22 megabytes). LocalTalk and parallel ports are standard, and it can automatically switch between PostScript and PCL 5 on the fly. Ethernet is available as an option, as is a SCSI interface.

For paper handling, the microLaser Pro 600 offers two 250-sheet paper-input trays and an optional 30-envelope input tray. The output tray can hold 250 sheets.

And in case the microLaser Pro 600's processor isn't fast enough for you, Texas Instruments also offers a 40-megahertz RISC accelerator that disengages the on-board processor.

As to durability, Texas Instruments is estimating an unusually long duty cycle: 10,000 pages a month and 15,000 pages per cartridge! The microLaser Pro 600 replaces the 9-ppm microLaser printers in the Texas Instruments printer lineup.

The **Silentwriter Model 1097** (\$1,499), from NEC Technologies (800-632-4636 or 508-264-8000), is something of a mixed blessing. It's a 10-ppm, 600-dpi PostScript Level 2 printer, but it's not

a true 600-dpi model: The engine is actually the same as in the Silentwriter Model 95, so you get a 300-dpi engine that interpolates to 600 dpi.



The Model 1097 uses a 20-megahertz Intel 80960 RISC processor and comes with 4 megabytes of RAM standard (expandable to 9 megabytes). LocalTalk, parallel, and serial ports are standard, and you can add an optional Ethernet interface. The Model 1097 supports PCL 5 and can switch ports and emulations automatically. As with


the Model 95, a PostScript fax option is available. A SCSI port is also standard.

For paper handling, the Model 1097 comes with a single 250-sheet input tray and offers an optional 10-envelope input tray. An optional, additional 250-sheet tray is also available.



At 300 dpi, the Model 1097 offers resolution enhancement for both text and graphics; the enhanced 300-dpi output we saw was virtually indistinguishable from the 600-dpi output.

### Up to Date . . .

**Canvas 3.5**, Deneba's "super" drawing package, is cross-platform-compatible with its Windows counterpart, supports pressure sensitivity, and lets you flow text across multiple columns and text boxes. 305-596-5644. \$399. ♦ **Redux Deluxe 2.0**, Inline Software's backup utility, offers scheduled backups, archiving, and network support. 203-435-4995. \$79.95. ♦ **CA-Cricket Graph III 1.5**, Computer Associates' graphing package, adds histograms and tables to the program's list of graph types. 516-342-5224. \$195. 

By Russell Ito



## Smart Draw

The smarter your software is, the less you should have to do to get what you want. That was basically the idea behind the original IntelliDraw. Aldus' smart drawing package, and the latest version has carried that concept even further, with templates, a drag-and-drop interface, and numerous effects.

With IntelliDraw 2.0, you can open any document as a template, so you can quickly assemble a drawing from existing templates. And because you can drag and drop objects across document windows — whether the documents are templates or not — you don't even have to go through the Clipboard.

IntelliDraw 2.0 includes new collections of templates and clip art, but its art isn't static. Instead, many of the items have variable properties, so by performing a simple action, such as moving a slider, you can change the art and "dial in" the desired shape, color, or size.

The effects gallery includes perspective and warping. You can add perspective effects to any object, group of objects, or text — in any orientation — and with warping, you can arbitrarily distort any object, group of objects, or text into different shapes.

Polymorphing, another type of effect, lets you morph

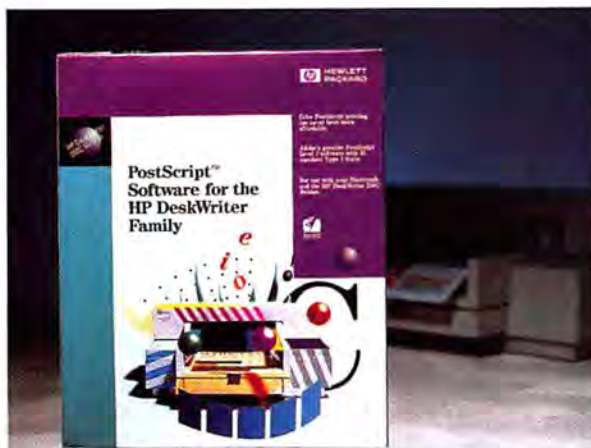
one shape into another while maintaining control over the process. For example, you can polymorph a teacup into a teapot and then, by using a simple slider, you can arbitrarily dial in any shape in between. Polymorphing can control shape and color, and one polymorph can control many others, so you can have a single slider that controls many different effects simultaneously.

Aldus Corp., 5120 Shoreham Place, San Diego, CA 92122; 619-558-6000. \$199.

## Cheap PostScript

The Hewlett-Packard DeskWriter 550C is just about the most affordable color printer you can buy. You get 300-dpi output, but what you don't get is PostScript — so if you use a PostScript application such as Illustrator, your output looks less than optimal. But now Adobe and HP have teamed up to create a true-PostScript product that gives you the DeskWriter 550C with color PostScript for less than \$1,000.

HP's PostScript Software for the HP DeskWriter Family is an Adobe PostScript software RIP that lets the 550C print true-PostScript output. Because the 550C doesn't have a processor or memory, you pay a price on the CPU side: The software



With a Hewlett-Packard DeskWriter 550C and PostScript Software for the HP DeskWriter Family, you can get true Adobe PostScript and a color printer for less than \$1,000.

requires a 68030- or 68040-based Mac with 8 megabytes of DRAM and 5 megabytes of free disk space.

Hewlett-Packard Co., Direct Marketing Organization, P.O. Box 58059, MS511L-SJ, Santa Clara, CA 95051; 800-752-0900 or 408-725-8900. \$249.

## EPA Utilities

Energy saving is a big topic these days, and Connectix has brought the issue to the desktop with CDU (Connectix Desktop Utilities), the first package of energy-saving utilities for the desktop.

With CDU installed, you can set your Mac to shut down automatically after a specified period of inactivity. Because this could be a dangerous option in the hands of a not-so-funny practical joker, Connectix lets you password-protect this option. If you don't want to go the shutdown route, you can just set your monitor to dim automatically after a period of CPU inactivity.

Many of CDU's other functions are adapted from Connectix's CPU (Connectix PowerBook Utilities) package. They include file syncing, custom cursors, file security, and Balloon Help removal.

Connectix Corp., 2655 Campus Drive, San Mateo, CA 94403; 800-950-5880 or 415-571-5100. \$99.

## A Pro's WalkThrough

Virtus WalkThrough introduced the concept of spatial visualization, letting users easily create 3-D environments and explore them randomly. What was missing was that extra bit of realism that could push things even further; now Virtus has created WalkThrough Pro to fill that gap.

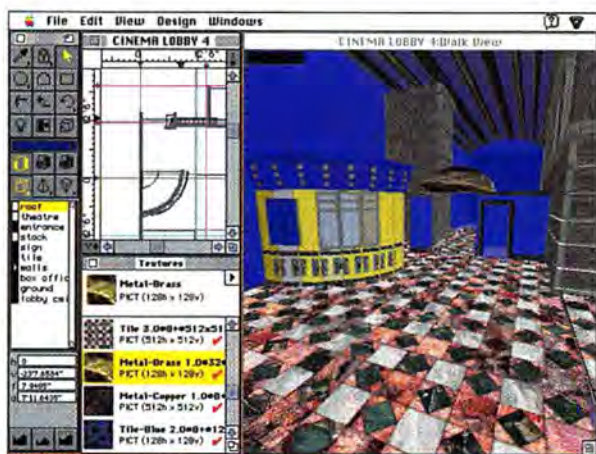
With WalkThrough Pro, you can add texture maps to your objects and still move through an environment in real time. WalkThrough Pro ships with a variety of textures, plus you can use any PICT graphic. You can even apply a QuickTime movie to a surface as a texture. If you do so, the movie plays in a continuous loop for as long as you hold the mouse button down — while you're moving through a space, the movie plays; when you stop, the movie stops.

Virtus Corp., 117 Edinborough S., Suite 204, Cary, NC 27511; 919-467-9700. \$395.



IntelliDraw 2.0's intelligence makes creating graphics even easier than with the previous version. The drag-and-drop interface lets you drag objects from a library window into your drawings.





Virtus WalkThrough Pro's support for texture maps — and even QuickTime movies as textures — brings realism to your spatial designs without a sacrifice in speed.

## Pro-Level 3-D

Packages for creating 3-D graphics keep getting more and more sophisticated, and now Strata has stretched its product line with StudioPro, a professional-level 3-D package that offers complete modeling, rendering, and animation environments, including special effects that haven't been seen on the Macintosh before.

The modeler, called 3d Sculpter, is a spline/vertex editor that allows you to easily mold organic shapes, almost as if you were working with clay. The modeler includes a 2-D tool that lets you reshape outlines imported from drawing programs such as Illustrator.

The renderer includes Ray-Paint, which lets you create rendered images that look as if they were prepared with traditional art media. With Ray-Paint, your brush strokes follow the geometry of the object, giving you traditional looks in full 3-D. RayPaint's effects include chalk, watercolor, dry brush, and even Seurat- and van Gogh-like treatments.

StudioPro's animation capabilities are extensible, so Strata and other developers can add special-effects extensions to the base program. Some of the included effects — called Explode, Shatter, and Atomize — let you create *Lawnmower Man*-like effects.

Strata, Inc., 2 W. St. George Blvd., Ancestor Square, Suite 2100, St. George, UT 84770; 801-628-5218. \$1,495.

— Russell Ito



Strata's StudioPro offers 3-D graphics professionals visual effects that haven't been seen — or even been possible to create — on the Mac before.



## Powerful Upgrades

*The first PowerPC Macs won't ship until early next year, but Apple and DayStar Digital are already talking about upgrade paths.*

**B**y now you may have heard that PowerPC Macs are going to set new standards for personal-computing power. Maybe you've been wondering whether you're going to have to get rid of your current Mac in order to purchase a PowerPC-based one? Or perhaps you aren't sure whether you should buy a new Mac because you don't know whether there will be an easy upgrade path?











Take heart: If you own a 68040-based Mac, you'll be able to upgrade your Mac rather than selling it and buying a new one. Apple has announced that it will provide PowerPC upgrades for the Centris 610 and 660Av; the Centris 650, Ilvix, Ilvi, and Performa 600; and the Quadra 800 and 840Av.

If you have Quadras of the 700, 900, or 950 variety, you're still in luck. DayStar Digital (800-962-2077 or 404-967-2077) has announced that it will be making upgrade cards for these three Macs. DayStar Digital will also provide its own upgrades for the same Macs Apple has announced upgrades for, and during 1994, it plans to develop PowerPC upgrades for all color-capable Macs.

Unfortunately, no pricing information for any of these upgrades was available at press time, and all we know about the introduction of the PowerPC Mac is that it's supposed to happen sometime during the first half of 1994. DayStar Digital has announced that its Quadra 700, 900, and 950 upgrades will be available when Apple ships the first PowerPC Macs.

— Stephan Somogyi

### Who will upgrade your Mac to PowerPC?

		
 Centris 610 and 660Av	 Centris 610 and 660Av	
 Centris 650, Ilvix, Ilvi, Performa 600	 Centris 650, Ilvix, Ilvi, Performa 600	 Quadra 800 and 840Av
 Quadra 800 and 840Av	 Quadra 700	 Quadra 900 and 950



# THIS SHOULD GIVE YOU OF WHY WE CREATED AN

The image you see over there started out attached to the image you see over here. But as it made its way to the printer, the computer it was created on recognized a problem: 11 x 17 pages can't fit on

8 1/2 x 11 paper.

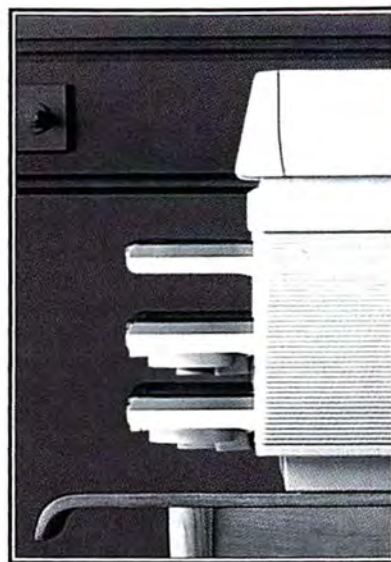
And so, out came the electronic scissors.

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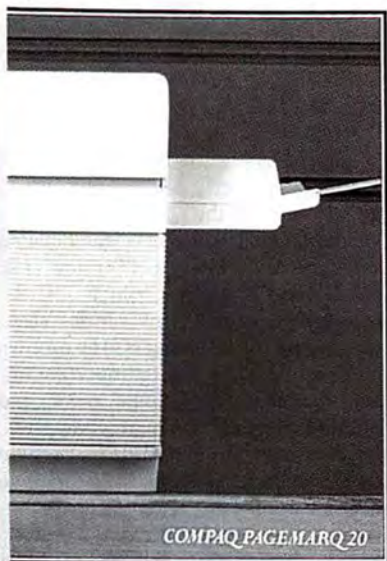
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## PAGE LAYOUT

# QuarkXPress 3.2

*QuarkXPress takes page designers over the color-management hurdle with new built-in tools from EFI.*

**Q**uarkXPress 3.2 launches the latest assault in the page-layout wars with a sophisticated color-management scheme — courtesy of the color-technology masters at EFI (Electronics for Imaging) — that works directly from within the QuarkXPress application. Additional enhancements, including AppleEvents support, a facility that automates file gathering for service-bureau jobs, and a handful of new composition conveniences and design options, add new luster to the already impressive QuarkXPress feature set.

## Integrated Color Management

For color management, QuarkXPress 3.2 features the EfiColor XTension. Conveniently integrated into QuarkXPress' own menus and dialog boxes,



the EFI color-management package for Adobe Photoshop. QuarkXPress is ahead of rival Aldus PageMaker on this front — PageMaker's support for color management was still on the drawing board at press time.

Overall, the EFI technology works behind the scenes to compensate for the different routes various printers, monitors, and scanners take to color rendering. The new XTension greatly improves color matching among these input and

output devices, so that the color output from your desktop color printer, for example, more closely resembles a Matchprint, a calibrated screen display, or even output from an offset press. But QuarkXPress 3.2's color-management system supports only the TIFF and PICT formats; direct support for EPS and DCS isn't available.

In order to test the capabilities of QuarkXPress' new color-management scheme, we imported a scanned color photo saved in

XTension enabled was much closer to the Matchprint than color produced without it.

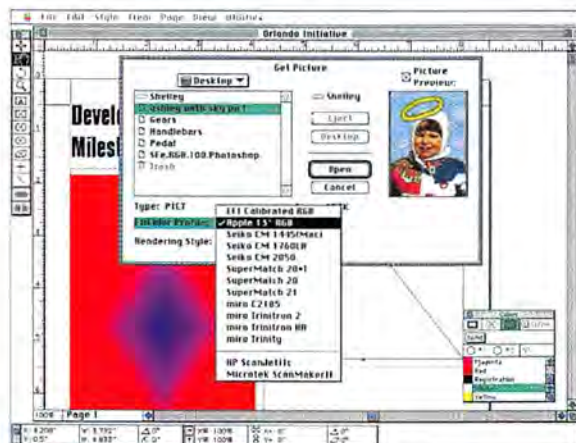
We don't, however, recommend that you zero out your budget for Matchprints quite yet. Although EfiColor allows for more-predictable and -consistent color-image output, it doesn't provide a perfect solution. Nevertheless, it makes color-correction tasks easier and gives you better color information earlier in the design process.

## In Profile

Understanding how to use the EfiColor XTension properly takes some effort, largely because the QuarkXPress documentation fails to provide clear, detailed examples. Central to the XTension's use are EfiColor's profiles, which describe the color capabilities of various scanners, monitors, and printers. The profiles come into play as you're importing images and as you're defining colors and printing from within QuarkXPress.

Choosing the right profile (or tagging an image, in EfiColorspeak) is intuitive enough when you create an image on-screen: You simply select your monitor's profile. It's also easy when you import an image directly after scanning: You select your scanner's profile. However, it gets confusing when you try to select the correct profile for an imported image you've color-edited. If your image-editing program doesn't support EfiColor, things can get hairy. The documentation for this aspect of the program isn't comprehensive enough to be much help. Once you've figured out which profile to use, though, tagging an image is easy with QuarkXPress' Get Picture dialog box. You can also simply choose to use the default profile.

Choosing the correct profile for colors defined in QuarkXPress and for output purposes is relatively straightforward. The only complaint we have is about the Page Setup dialog box: EfiColor doesn't always intelligently narrow down your output-profile choices in response to

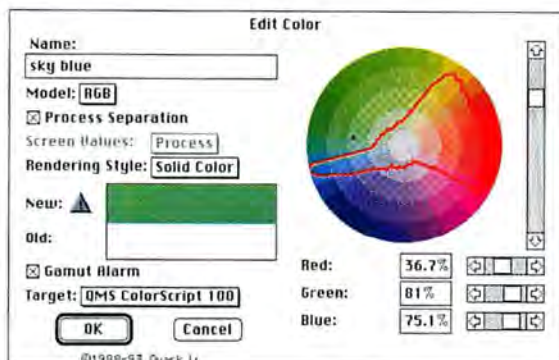


QuarkXPress boasts impressive new color-management tools, which are well integrated into the program's own menus and dialog boxes. The Get Picture dialog box lets page designers easily tag an image with a device profile.

this software-based technology addresses a problem that has long plagued page designers: inconsistent color-image output from the wide variety of printing presses and desktop color printers. The technology behind EfiColor is the same as that used in EFI's innovative color-editing software, Cachet, as well as in

ported a scanned color photo saved in TIFF format into QuarkXPress and printed the image — both with and without the EfiColor XTension enabled — on several color printers. We then compared the printouts to a Matchprint generated from the original image. In every case, color produced with the EfiColor





QuarkXPress' new Gamut Alarm shows up as a small triangle with an exclamation point. The alarm alerts you when you specify a color that's unprintable on the output device you've selected. The outline on the color wheel indicates the printable colors for the selected printer (here a QMS ColorScript 100).

the type of printer you've selected.

At press time, the number of profiles included with the package was limited, especially for scanners, but EFI promises more soon. The package we reviewed included profiles for 3 desktop color printers, 2 scanners, and 12 monitors as well as press profiles for the Euroscale and SWOP (Specifications for Web Offset Publications) standards. EFI says additional monitor profiles currently under development will be gratis to QuarkXPress 3.2 owners. Additional input- and output-device profiles will cost extra. If a profile for your printer or scanner is not among those included in the package, be prepared to fork out an additional \$129 to \$529 per profile.

EFI designs each profile to correspond to a device operating under certain conditions that must be met for optimal color matching. Plan to spend some setup time with your printer, for example, making sure you have the right version of the printer driver installed, are using the correct paper and toner, and have selected the specified print settings.

Every output device has its own range, or *gamut*, of printable colors. When designers create colors on-screen that are unprintable or out of gamut, production people are likely to become frustrated. QuarkXPress' new Gamut Alarm, which is part of the EfiColor XTension, is designed to put an end to that problem. With EfiColor, when you define a new color, you must also select an output device in the Edit Color dialog box. EfiColor compares its gamut with the color you're defining. If you attempt to

define an out-of-gamut color, an alarm triangle will appear. To change the color to one that's within the allowable gamut, you use the handy gamut indicator on the adjacent color wheel.

In some cases, you may want to print to a device other than the one whose gamut you specified while defining your colors. Unfortunately, the program lacks a facility that simply checks all QuarkXPress-created colors and then dis-

plays out-of-gamut warnings, if needed, when you select your output device.

Color management isn't the only improvement in the latest version of QuarkXPress. If you've ever sent page files to your service bureau only to have them returned or processed incorrectly because you forgot to send all the needed files or list all the fonts you used, you'll welcome the new Collect for Output feature. This facility automatically copies all files required for a job and drops them into the folder of your choice. QuarkXPress also automatically prepares a useful document listing all pertinent file information, including the fonts you used, the required XTensions, and the color plates necessary for each page.

With version 3.2, QuarkXPress joins PageMaker on the scripting bandwagon. QuarkXPress' newly added support for Apple events lets you automate repetitive tasks by writing scripts with AppleScript or UserLand Frontier. A run-time version of Frontier and a handful of sample scripts are included to whet your appetite, but you'll need to purchase your own scripting package if you want to take advantage of this new feature.

A variety of new conveniences helps

speed production. The Speed Scrolling feature greets pictures and color blends as you scroll, speeding up redraws considerably as you navigate your documents. This does not, however, make up for QuarkXPress' continued lack of interruptible screen redraw, a handy feature PageMaker added with version 4.2.

Other new conveniences include the ability to specify a color by dragging a swatch from the Colors palette over any item on your document. You can also drag items, groups, or entire pages from document to document. Version 3.2's support for as many as 25 open documents adds to the program's flexibility. In addition, enhanced style-sheet features streamline word processing.

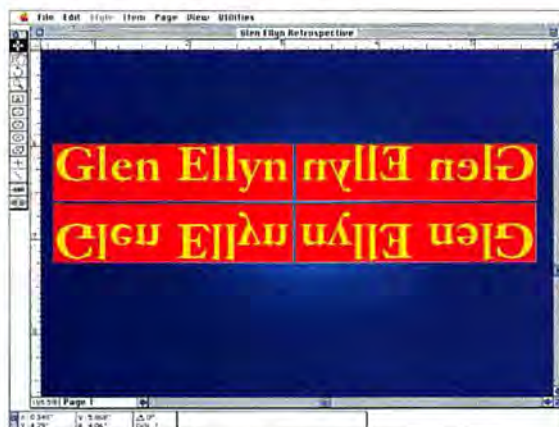
Those who use QuarkXPress on PCs as well as Macs will welcome the new version's expanded cross-platform compatibilities, including font-translation enhancements and full file compatibility between the Mac and Windows versions of the program.

Last but not least, the new design features include five additional blends in the Cool Blends XTension, box skew and flip, and vertical character scaling.

### The Bottom Line

New features in QuarkXPress 3.2 significantly up the ante in the page-layout competition. Most notable is the incorporation of the Efi color-matching technology, which speeds up color correction and gives page designers more-predictable color results overall.

— *Shelley Cryan*



QuarkXPress 3.2 offers a handful of new design features, including the ability to flip the contents of text boxes horizontally and vertically (shown here). You can also scale text vertically and skew text boxes and pictures.



## VIDEO

# Movie Movie

*The Movie Movie captures video and audio to QuickTime movies at a bargain price.*

The Sigma Designs Movie Movie is the first serious challenger to the SuperMac VideoSpigot, previously the low-end tool for turning analog video into QuickTime movies. The Movie Movie includes built-in mono sound-digitizing capabilities, which the VideoSpigot can't provide unless you purchase it bundled with the Macromedia MacRecorder. Furthermore, the Movie Movie's Sony video circuitry enables it to blow the doors off the VideoSpigot/MacRecorder bundle in terms of image quality.

## Learning the Parts

The Movie Movie is a single NuBus card (small enough to fit in a Centris 610) with both video and audio input. An RCA jack handles composite-video input, and a single phono plug handles 8-bit, 22-kilohertz audio input (comparable with the input you get with the MacRecorder). It is unfortunate that the card lacks an S-video input jack, which would allow slightly higher-quality video input.

The Movie Movie's software includes a basic video-capture application called ScreenEdit plus separate Vdig (video digitizing) components for video and audio. The Vdig components allow you to drive the digitizer from within applications that support QuickTime direct



### Movie Movie 1.0

**Published by:** Sigma Designs, Inc., 47900 Bayside Parkway, Fremont, CA 94538; 510-770-0100.  
**List Price:** \$349; \$449 with VideoShop.

capture, such as Adobe Premiere. ScreenEdit offers basic digitizing controls and is similar to ScreenPlay, the VideoSpigot software. It can display incoming video in typical QuickTime-movie sizes and at full-screen size (in each case with full audio). The controls for incoming audio include an LED-segment VU (volume units) meter (with peak-hold display, a handy feature included in many consumer audio- and videocassette decks) and separate gain and volume controls. Real-time slider controls let you adjust the brightness, contrast, color, and sharpness of incoming video. You can simultaneously preview both video and audio in ScreenEdit, a capability sorely lacking in the VideoSpigot software.

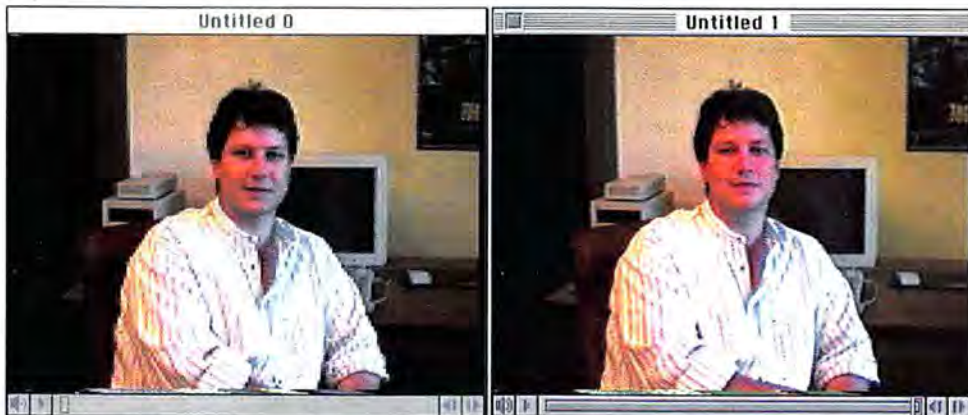
## Screen Tests

The true test of the Movie Movie is how it compares in capture speed and image quality with its competitor from

SuperMac. We tested each card in a Quadra 950 with 32 megabytes of RAM. In addition, we tested the Movie Movie in a stock Mac II with a DayStar 68030 50-megahertz accelerator (with a math coprocessor) and 20 megabytes of RAM.

When we used the Movie Movie's ScreenEdit software to record video footage from a camcorder, the capture rate and speed were excellent. We achieved 18 fps (frames per second) at a 160-x-120-pixel movie size on the DayStar Mac II and 30 fps on the Quadra 950 (also at 160 x 120 pixels). In contrast, the VideoSpigot provided a maximum capture speed of 18 fps on the Quadra 950 at 160 x 120 pixels (rates of 10 to 12 fps are typical when you use the VideoSpigot with lesser CPUs). Using the Movie Movie to digitize at the larger QuickTime-movie size (320 x 240 pixels) resulted in significantly reduced speeds (10 fps on the Quadra 950) unless we used the Faster capture mode, which let us capture at 18 fps but resulted in a lower-quality image. It's realistic to assume you'll need a higher-end digitizing product, such as the RasterOps Movie Pack system, to make 30-fps, 320-x-240-pixel QuickTime movies.

The Movie Movie clearly bested the VideoSpigot in video quality. The QuickTime movie we produced with the Movie Movie boasted crisp details and good



Using the Movie Movie's Faster capture mode (left), we were able to capture 320-x-240-pixel movies at 18 fps (the top capture rate we could get for the smaller 160-x-120-pixel movies with the VideoSpigot). The regular capture mode provided higher quality for the same-size image (right) at 10 fps.



brightness balance. (Of course, the quality of the video source has a large impact on overall digitization quality.) The movie we produced with the VideoSpigot from the same video source was noticeably darker, with more quantization artifacts in areas of smooth shading.

You can also use the Movie Movie to digitize still frames of incoming video at 640 x 480 pixels, and you can set it to preview incoming video at the enlarged size along with the corresponding audio. On the Quadra 950, the video quality and speed (10 fps) are surprisingly good for the size of the picture. An interlaced-field-interpolation option helps generate a clean still image from a shaky video source, such as a paused VHS deck.

### Sound Check

Movies recorded with the Movie Movie at 160 x 120 pixels with sound enjoy exceptional video/audio synchronization — much better than you get with any other low-end offering on the Mac (or on the PC, for that matter). However, we encountered some problems with sound amplification.

Although the Movie Movie has software-based gain and volume controls, the range of amplification is much weaker than with the MacRecorder (which has an external analog volume dial). When you're recording sources that have weak audio signals, you need to amplify the signal before it reaches the Movie Movie card. This is a simple matter for audio or MIDI enthusiasts, who can pipe signals through their master mixers before sending them to the Movie Movie, but it's likely to be a headache for those who lack such equipment.

Because the Movie Movie software includes separate Vdigs for audio and video, we thought we might bypass the amplification problem by using the Movie Movie to capture just video and by using a connected MacRecorder system to record audio; unfortunately, this scheme didn't work from within the Movie Movie's ScreenEdit application. Not yet ready to give up, we booted Adobe Premiere and then selected the Movie Movie video Vdig and the MacRecorder audio Vdig. Although this scheme worked, neither the frame rate nor the audio synchronization were up to the quality we got by recording directly from the ScreenEdit software, using the Movie Movie's on-board audio.

### Bother Bother

Sound amplification wasn't the only problem we had with the Movie Movie's software. ScreenEdit also doesn't let you select sizes that don't conform to the standard 160-x-120- and 320-x-240-pixel QuickTime defaults. For example, you can't record a movie at 240 x 180 pixels, which is the *sweet* size (the size that gives you the best trade-off between image information and capture rate) for Compact Video, the most popular compression option in QuickTime 1.6. The software should let you numerically specify the exact capture size to work around this limitation, but unfortunately it doesn't.

Also, as with the VideoSpigot software, you can't choose to record sound at any sample rate other than 22 kilohertz, which prevents you from recording sound at a lower sample rate in order to increase the frame-grab rate slightly.

A few small problems impede the installation process. First, the Movie Movie package doesn't include the cables required to hook up the card to a video and/or audio source. These cables don't cost much at your local electronics-supply store, but we think Sigma should consider including them in the box. Also, the Movie Movie's documentation lacks detailed descriptions of the program's capabilities and explanations of the various QuickTime compression schemes (although this information is available elsewhere, first-time QuickTime users would find it very helpful if it were included here). Finally, we were unable to use the video and audio Vdigs from within Premiere, because the Movie Movie Vdigs loaded before the QuickTime extension at startup. Although we were able to use an extension manager to

change the extension-loading order (loading QuickTime before the Vdigs), the documentation doesn't warn you of this possibility, let alone tell you how to work around it.

### The Bottom Line

If you've been looking for an easy way to get low-end QuickTime into your Macintosh, look no further than the Movie Movie. Its still-frame-grab feature doesn't replace more-professional (and more-expensive) alternatives, but its overall capture capabilities beat those of the SuperMac VideoSpigot in both image quality and audio/video synchronization, at a lower price. As long as you can make do with 160-x-120-pixel QuickTime movies, you'll get the elusive, affordable 30 fps you've always dreamed about.

— David Biedny



The Movie Movie software's real-time slider controls let you modify incoming audio levels and video-signal characteristics. The ability to simultaneously preview both video and audio is an advantage over the SuperMac VideoSpigot.



## OUTPUT DEVICES

# The Apple Portable StyleWriter and the MOBILEWriterPS

*Apple and Mannesmann Tally each hit the road with a portable printer tailored for PowerBook owners.*

If you thought the GCC WriteMove II was the only portable printer in town designed for PowerBook owners, think again. Mannesmann Tally recently introduced the \$999 MOBILEWriterPS, an impressive portable *PostScript* printer that doubles as a desktop printer. A less expensive alternative to the MOBILEWriterPS is the new Apple Portable StyleWriter, a redesign that packs the original StyleWriter into a smaller and lighter case.

## MOBILEWriterPS

The MOBILEWriterPS is the first portable 300-dpi *PostScript* printer designed exclusively with PowerBook owners in mind. It's color-coordinated, it's almost the same size as the PowerBook, and it weighs just a little more than 8 pounds. Although not as convenient to carry as the lighter-weight QuickDraw-based Apple Portable StyleWriter,

**Apple Portable StyleWriter**  
 Manufactured by: Apple  
 Computer, Inc., 20525 Mariani  
 Avenue, Cupertino, CA 95014;  
 800-776-2333 or 408-996-1010.  
 List Price: \$439.

**MOBILEWriterPS**  
 Manufactured by: Mannesmann  
 Tally, 8301 180th Street S.,  
 Kent, WA 98032; 800-843-1347  
 or 206-251-5524.  
 List Price: \$999.

it offers more features and versatility. The best news is that the MOBILEWriterPS is so well designed that it can serve as your desktop printer as well as your on-the-road companion.

At the heart of the MOBILEWriterPS is a 16-megahertz 68000 processor and 2 megabytes of RAM, which means that this printer is not only portable but also fast. At a very swift 6 pages per minute, the MOBILEWriterPS' speed either equals or surpasses that of many desktop laser printers.

The print quality of both graphics and text outclasses that of inkjet printers, even though the latter offer slightly

higher resolution (360 dpi compared to the MOBILEWriterPS' 300 dpi). The advantage stems from the MOBILEWriterPS' thermal-wax ribbon, which produces crisp output with a smooth, waxy finish that doesn't wrinkle the paper. On the whole, graphic output is good — just what you would expect from a *PostScript* printer. Text quality, however, can't quite match that of a laser printer. Expect some minor breaks and jaggedness in the type.

The one disadvantage of the thermal-wax ribbon is its cost — ribbons come bundled in 5-packs priced at \$75. One ribbon is good for about 150 pages, which means you get (at best) 750 pages per pack. That's expensive relative to the 3,000 to 5,000 pages you get from a similarly priced toner cartridge for a laser printer. The printer's battery is good for about 150 pages before you have to recharge it — that's more than twice the number of pages you get from the StyleWriter's battery.

Because the MOBILEWriterPS is essentially a *PostScript* LaserWriter, you don't need a special printer driver. You simply connect your Mac to the printer with the supplied 8-pin DIN cable and select the standard Apple LaserWriter driver in the Chooser. For those planning to print documents from Aldus PageMaker or FreeHand, the package includes the special Aldus PPD (*PostScript* Printer Description).

Although it's nice to be up and running with the MOBILEWriterPS without having to install any special software, several other aspects of the setup process are a bit awkward and confusing. The process of installing the ribbon and extending the paper feed, for example, is not as easy as it should be and is not explained well in the manual. Moreover, the printer's many knobs, levers, and buttons are packed into a tiny



At 6 pages per minute, the portable 300-dpi *PostScript* MOBILEWriterPS (right), from Mannesmann Tally, is fast enough to serve as a desktop printer as well as a travel companion. The Apple Portable StyleWriter (left) is a 360-dpi inkjet QuickDraw printer that's lighter and less expensive than the MOBILEWriterPS, but it can't match the latter's speed and output quality.



space, making it hard to push, pull, and slide everything into place.

The MOBILEWriterPS comes with both a standard AppleTalk port and a parallel port — good news for the many PC users who are attracted to the PowerBook. You can also set up the MOBILEWriterPS as a network printer on an AppleTalk network. The printer supports automatic switching between PostScript and HP-PCL 4 (LaserJet II) emulations. The printer's Level 1 PostScript is a Microsoft clone of the Adobe original, but we encountered no compatibility problems during our testing.

The MOBILEWriterPS handles standard paper sizes (letter, legal, A4, and B5), transparencies, #10 business envelopes, and labels. It also boasts a built-in 80-sheet paper feeder, which the Portable StyleWriter doesn't have. Because the MOBILEWriterPS doesn't use ink cartridges, there's no smearing, so you can handle and stack pages as they emerge from the printer.

#### Apple Portable StyleWriter

The \$439 Apple Portable StyleWriter is essentially a variation of the original StyleWriter designed to accommodate a sheet feeder and a battery pack. It's a 360-dpi thermal inkjet QuickDraw printer that's approximately the same size as a PowerBook 170 and weighs a mere 4.5 pounds.

Installing the driver software and optional 39 TrueType fonts is a snap. The software requires System 7 or later. The package includes the SpoolMaster utility for background-printing support, an interface cable, a power adapter, one ink cartridge, and the battery.

Like the MOBILEWriterPS, the Portable StyleWriter handles standard paper sizes, transparencies, #10 business envelopes, and labels. Unless you purchase the optional \$85 50-sheet automatic sheet feeder, you must feed the paper into the printer one sheet at a time. This works fine for small print jobs on the road, but it rules out the option of using the Portable StyleWriter as a desktop printer. The battery is rated at 60 pages per charge. Replacement ink cartridges cost \$19; each cartridge is rated to last for about 500 pages.

Although it's unfair to compare the Portable StyleWriter with desktop printers, there are speed and output issues to consider. Because the printer relies on

your Macintosh to do the print processing, its speed depends on the power of your Mac's CPU. Even a powerful CPU, though, can't make the Portable StyleWriter print faster than its advertised 1.5 pages per minute.

Text prints faster than graphics, but the Portable StyleWriter is simply not designed for producing graphics-intensive pages. The output quality of both text and graphics is acceptable at 360 dpi, but given the nature of inkjet printing, it's never going to match the crispness of laser output. Text, in particular, looks fuzzy. You can also expect some dimpling of the paper, especially when you are printing pages that contain large graphics.

The Portable StyleWriter is a solid offering for PowerBook owners who don't require the PostScript support and speed of the MOBILEWriterPS, but similarly priced alternatives to the Apple printer are worth considering. The most attractive is the \$599 GCC WriteMove II portable printer. It produces sharper text and graphics output, and its diminutive Cracker Jack-box size makes the Portable StyleWriter look bloated. If you're truly looking for portability, you can't beat the GCC printer. However, the WriteMove II has one drawback — feeding it paper can be tricky.

The Canon Bubble Jet family (especially the BJ-10EX) also offers an alternative. The drawback is that you must purchase a separate printer driver (the \$149 PowerPrint package, from GDT Softworks, for example), which can swallow the price advantage offered by the heavily discounted Canon models.

#### The Bottom Line

If you're looking for high-quality printing, speed, and portability in one package, the Mannesmann Tally MOBILEWriterPS is an excellent buy, especially when you consider that it can serve as a desktop printer as well as a traveling companion. It offers the most versatility and power of any portable printer currently available for the Mac. If you need a printer that's easier on the budget and you're willing to sacrifice speed and output quality, the Apple Portable StyleWriter is worth a look. But the GCC WriteMove II, although slightly slower than the Portable StyleWriter, offers higher-quality output.

— Gregory Wasson



The MOBILEWriterPS' thermal-wax ribbon produces crisp output (top) with a smooth, waxy finish that doesn't wrinkle the paper. Output from the less expensive Apple Portable StyleWriter (bottom) looks muddy by comparison.



## SCANNERS

# Nikon Coolscan

*Nikon's little slide scanner delivers big production value.*

The Nikon Coolscan is a serious design and production tool that offers real bang for the buck. The diminutive \$2,495 device scans 35mm slides and negatives at resolutions as high as 2,700 pixels per inch at a bit depth of 8 bits per color. A full-resolution scan results in a 24-megabyte file — that's enough information to reproduce an image comfortably at full-page size.

## It's Cool

The Nikon Coolscan is aptly named. Instead of a conventional lamp, it uses an array of red, green, and blue LEDs to provide light. This approach has several benefits, including long life (the light source is expected to last for the lifetime of the scanner), negligible warm-up time, and no variation in the light source over time (which means you don't have to recalibrate the scanner). Furthermore, the Coolscan is, well, cool.



The Nikon Coolscan is a mighty little wonder of a slide scanner that boasts high-quality scans at a price lower than that of many competing slide scanners.

First, it's so small and draws so little power that Nikon makes an internal unit that mounts inside any Mac equipped with a bay for a 5.25-inch half-height drive. For this review, however, we tested the external model, which is also compact. In fact, at 12 x 6 x 2 inches, it's by far the smallest slide scanner we've seen. It's also easy to use — the Coolscan is as



## Nikon Coolscan

**Manufactured by:** Nikon, Inc.,  
Electronic Imaging Department,  
1300 Walt Whitman Road,  
Melville, NY 11747; 516-547-4355.  
**List Price:** \$2,495 external,  
\$2,195 internal.

plug-and-play as any Mac SCSI device.

The scanner's software is equally straightforward. In addition to Nikon Scanner 4.0, a Photoshop-compatible plug-in that works with a variety of applications (EFI's Cachet and Fractal Design's ColorStudio, to name a couple), Nikon includes a basic scanning application called Coolscan Control. This application lets you scan images, save them in PICT or TIFF format, and view them at various levels of magnification; for actual scanner control, it uses the Nikon Scanner plug-in.

Mounted slides pop straight into the scanner, and the Coolscan comes with a filmstrip holder for loading unmounted film, either positive or negative. Filmstrip length is limited to an entirely reasonable six frames.

The plug-in software's controls are largely self-explanatory, but comprehensive interactive help is readily available. You first choose the appropriate film type — color positive, color negative, black-and-white positive, black-and-white negative — from the Film Type pop-up menu and then click on Preview for a quick preview scan. The software automatically decides the exposure settings for the image. Using the preview image, you set the cropping rectangle and adjust the exposure settings. The plug-in also lets you set the output size (height and width) and resolution.

The last setting, Pitch, is particular to Nikon. It's basically a measure of the resolution — a value of 1 scans at the full resolution of the scanner, and higher numbers scan at progressively lower resolutions.

The plug-in's main dialog box lets you enter numerical values for brightness and contrast as well as for red, green, and blue exposures. These controls act on the analog data from the CCD (charge-coupled device) and are best used for making major corrections. Fine-tuning controls are available with the software's gamma-curve editor, which lets you adjust the overall gamma curve as well as individual curves for red, green, and blue. You can also set a black point and a white point and view a histogram of the image. For repetitive scanning of the same film type, you can save and load custom gamma settings.

The Coolscan is also noteworthy for offering a real focus control, a feature sadly lacking on many transparency scanners. You adjust the Coolscan's focus with a thumbwheel located on the device itself.

The Coolscan is fairly speedy. A preview scan takes about a minute and a half. A low-resolution 72-dpi scan that results in a 1.5-megabyte file takes about two and a half minutes. A full-resolution 24-megabyte scan takes about twelve and a half minutes. We were particularly impressed with the results we obtained from scanning negatives — the Coolscan is the first scanner we've seen in its price range that produces acceptable results.

## The Bottom Line

The Nikon Coolscan is an impressive slide scanner that compares favorably with scanners costing considerably more. It's easy enough for novices to use yet powerful enough for professionals. The Coolscan's documentation is clear and informative and offers a particularly valuable section on handling film. In short, the Coolscan is hot news.

— Bruce Fraser



# BrushStrokes

*BrushStrokes jockeys for a top slot in the low-cost paint-program arena.*

The most recent entry to the budget-color-paint-program category more than holds its own against the competition. BrushStrokes is a 32-bit program that features an elegantly designed interface, a wide assortment of feature-rich tools, and surprising image-processing power — all for an affordable \$139.

## No Brush-off

The BrushStrokes interface is intuitive and easy to use and provides lots of helpful feedback. Floating palettes let you customize brushes, patterns, and colors. Many of the program's dialog boxes allow you to experiment with brush settings. Preview windows let you view the effects of filters before you apply them. You can configure the Tools palette to display icons that represent currently selected foreground, background, and line colors, so you know at a glance what the results of using a particular tool will be.

Similarly, when you select a brush, the cursor shows you exactly what that brush will do when you apply it. If you've chosen a large square brush to apply a dark-red foreground color, for example, the cursor becomes a dark-red square. This helpful feedback takes a lot of the guesswork out of painting. Other pluses are five levels of undo and the program's ability to interrupt screen redraws as you make menu selections.

BrushStrokes' ability to dither color on 8-bit displays means you can work with millions of colors instead of just 256. You can work at resolutions as high as 600 dpi and open and save files in PICT, TIFF, or StartupScreen format.

BrushStrokes works with several Photoshop plug-ins, which means if your scanner uses a plug-in, you can scan images from within BrushStrokes. You can also use third-party plug-ins, such as Aldus Gallery Effects, to create special effects.

In addition to all the basic tools you expect in a paint program, BrushStrokes has a variety of impressive extras. The



**BrushStrokes 1.0v1**  
**Published by:** Claris, 5201  
 Patrick Henry Drive, Santa Clara,  
 CA 95052; 408-727-8227.  
**List Price:** \$139.

brush tool works in 13 modes. You can opt to smear the color you're painting on, for example, and lighten or darken colors with your brush stroke. You can also have the paintbrush or the spray can cycle through a range of colors as you paint. If you're using System 7, you can even set BrushStrokes to automatically anti-alias edges, smoothing out jaggies as you create shapes and lines.

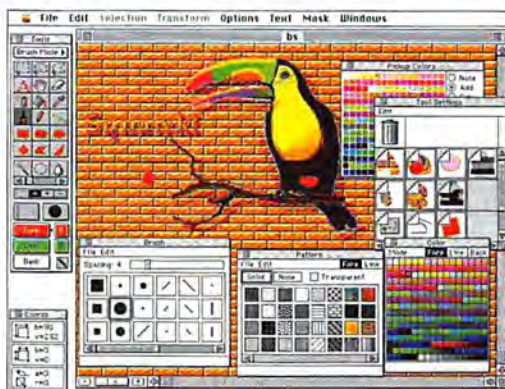
The package includes nine special plug-in tools, including a magic wand; a rubber stamp; and the Snappy tool, which lets you quickly make small rectangular selections for copying into the customizable Brush or Pattern palettes. The Impressionist tool, which uses repeating patterns to create images reminiscent of Seurat or Monet paintings, is particularly impressive.

Most tools have multiple variations, so you'll want to spend some time configuring them to your specifications. Once you've configured them, though, you can save them to the Tool Settings palette. When you click on a setting, that setting is instantly restored. You can even copy and paste your tools among open documents.

BrushStrokes boasts an impressive array of controls for selecting and masking image areas. You can get the effect of layering a paint document by creating *slips*, areas of color you can exclude from image-area selections. You can turn selections into masks as well as mask out specific colors.

To set masking and slip colors, you select colors from the Pickup Colors palette, using the eyedropper tool. Although somewhat confusing at first, the palette makes it easy for you to quickly modify selections on the fly without constantly returning to selection tools.

A wealth of options is available for modifying selections. You can rotate, flip, stretch, distort, and even apply perspective to your selections. The program also provides 14 Photoshop-like image-enhancing filters, including mosaic,



**BrushStrokes is impressively feature-rich for a \$139 paint program.**

emboss, colorize, brightness/contrast, and Gaussian blurs.

In addition to supporting custom pattern fills, BrushStrokes lets you define and apply a wide variety of multicolored gradient fills, either directional or shaped to fit the selection.

BrushStrokes requires at least 2 megabytes of RAM and runs on any Mac that supports Color QuickDraw.

## The Bottom Line

BrushStrokes offers an impressive array of features at a budget price. The program's well-designed interface lets you get your hands on its power quickly and intuitively, and its flexibility encourages experimentation. We highly recommend it.

— Eric Taub



## UTILITIES

# eDisk and Stacker for Macintosh

*Two utilities double your disk capacity at a bargain price, but there's a catch.*

Two new driver-level compression utilities aim to double the size of your hard disk automatically. Stacker for Macintosh, from the veteran PC-compression-software company Stac Electronics, and eDisk, from Alysis Software, each offer a more feature-rich route to expanded disk space than the first driver-level compressor for the Mac, Golden Triangle's TimesTwo. Of the three, Stacker gains the edge with its simplicity and ease of use.

Unlike TimesTwo — a stand-alone disk formatter that installs its own custom driver on your hard disk — eDisk and Stacker each patch your existing disk's driver with compression routines. That means if your existing driver features partitioning and universal support for a full range of media, you'll get the same functionality with your expanded disk (one exception is driver-level password security).

## Installation

Installing Stacker is a study in simplicity. You first perform a complete backup (to satisfy Murphy's Law) and check the data structures on your disk with a utility such as Apple's Disk First Aid; then you install Stacker by clicking on a single button and selecting the disk you want to expand. The Stacker application patches the disk driver and compresses all of the disk's existing files. When you quit Stacker, your disk is capable of storing twice as much data.

By contrast, eDisk's installation needs improvement. In our tests, the installation application didn't recognize the Apple and Drive7 drivers on our disks and even displayed some ominous "Unknown driver" warnings. Despite this unsettling experience, however, the installation



### eDisk 1.0

**Published by:** Alysis Software Corp., 1231 31st Avenue, San Francisco, CA 94122; 415-566-2263.  
**List Price:** \$149.95.



### Stacker for Macintosh 1.0

**Published by:** Stac, 5993 Avenida Encinas, Carlsbad, CA 92008; 619-431-7474.  
**List Price:** \$149.

proceeded without a hitch.

One especially frustrating aspect of the eDisk installation is that it erases all the existing data on the disk you choose to expand. Alysis says this is merely a safety precaution — if users know that all of their data will be destroyed, they will be certain to perform a backup before installing eDisk — but we found it disconcerting to have to start from scratch with an empty disk.

Once you've installed the utility, you have the option of tweaking several settings for optimal performance. But this procedure can be frustrating — if you don't get the settings just right (you have to know what you're doing), performance can be abysmal. Chances are you'll have

to twiddle with the settings to some extent anyway. For example, an automatic optimization feature in eDisk's initial release prevented our PowerBook 100 from entering Sleep mode until we turned the feature off.

Once fully in place, however, both Stacker and eDisk operate transparently and require no further tweaking.

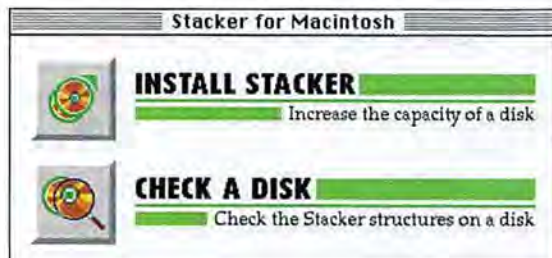
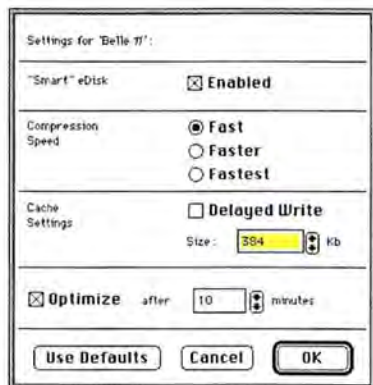
## Operation

Disks expanded with eDisk and Stacker function more or less as you'd expect. However, each utility has problems with removable cartridges. If you don't install special auto-mounting system extensions (included with the software), you'll be able to mount expanded cartridges at startup only. In addition, both Alysis and Stac advise you to avoid using virtual memory on expanded disks. Alysis warns of system crashes; Stac merely mentions that using virtual memory on an expanded disk slows data access considerably.

The one serious incompatibility we experienced is Stacker's aversion to accelerator cards. According to Stac, bug fixes should be available by the time this review appears.

## Speed and Compression

Each utility compresses raw data as it is written to a disk and decompresses data as it is read from a disk. But because



Installing the eDisk driver-level compression utility (left) is not as simple as installing Stacker for Macintosh (above). eDisk's performance-tuning settings can be confusing; Stacker installs with a simple click on a button.



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• Ethernet  
• LocalTalk

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800-538-8861



# Welcome To Focus!



Welcome to a better way to purchase Mac enhancements. Focus Enhancements has the ability to provide you with the absolute best value, support, service, and technical knowledge in the industry. Our mission is simple:

- We will develop the most advanced enhancements that can be created.
- We will build the highest quality products that can be built.
- We will deliver the best service & support possible.
- We will add value to every product we sell.
- We will deliver the lowest price possible directly to you.

With these five goals, you can be assured that every Focus product is without question, the best product that your hard-earned money can buy. **We have over 1,000,000 products installed around the world.** Our satisfied customers have expanded their potential and budgets with our quality products. We are dedicated to winning your support and loyalty.

*Thomas*

Thomas L. Massie  
President & CEO

## THE SECRET TO OUR LOW PRICES

*It's simple. We bypass all the middlemen. No retail stores. No distributors. No merchandising reps. No brokers. Just us. Selling our own products direct to you, and passing on incredible savings and service.*

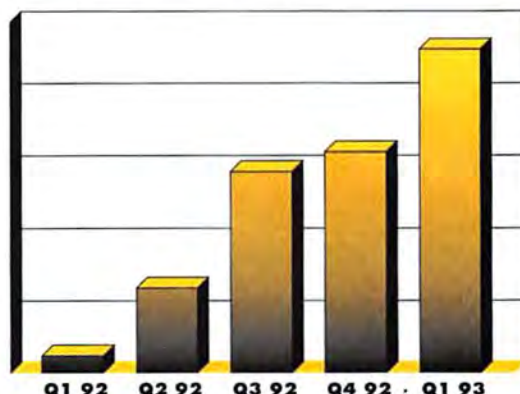


*All the money that would otherwise go to landlords, clerks and salesmen, sales managers, and advertising is slashed from our price. So you save 40% to 70% every day, every time you purchase from Focus. If within 30 days you find it for less at any retailer, Mac Connection, MacWarehouse, or Mac Zone, we'll refund the difference.*

# Climbing To New Heights

At Focus Enhancements we constantly talk to customers just like you, and we think we are pretty good listeners. You have told us that you need high-quality products. You need products that solve real problems, and you need to get them quickly at great prices.

*Actual Revenue growth per quarter.*



Giving the customer what they want has been our philosophy from our inception in 1991. Due to our "Customer comes first" philosophy, we have **grown at an average rate of 150%** per quarter over the last five quarters. We now have over one million products installed worldwide and continue to ship over 25,000 products every month to satisfied customers like you.

You can count on us to continue to listen to your needs. So what are you waiting for? Give us a call. We would love to listen to what you have to say!



*Focus Worldwide Headquarters is located in the technology corridor of Massachusetts.*



### The Best Prices, And No Middleman

*We are the original manufacturer, and we only sell direct to you, the customer! Why should you pay extra for retailing, distribution, and merchandising?*



# Products And Service In An Instant.

When you're ready to buy, you don't want to wait for delivery. That's why we're introducing our "buy it today, get it tomorrow" service. No matter how many products you order, we'll deliver them tomorrow for one low shipping charge of \$9.99\*. And after you buy, Focus is dedicated to providing you with the best technical support possible. You can call us seven days a week and get the service you need. It is important to us that you feel secure about the performance of your network, the reliability of your data storage, and the ease of your remote communications. We are not just here to sell you a product, but to establish a long-term relationship of supplying you with high quality products at the best value. We back up our commitment to your satisfaction by providing on-call tech support 7 days a week. And we are happy to give you technical advice before you buy. You can count on us for straight answers on our products and others', and how they can best improve your Macintosh system. So give our Tech Support team a call and we'll get you up and running!



\*Only applies to "in-stock" items; orders must be placed by 4:00pm EST, applies to continental USA only.



## 30-DAY "LOVE IT OR RETURN IT" GUARANTEE

At Focus we guarantee every product we make. If you are not 100% satisfied with a product for any reason, call our Tech Support Department for a Return Authorization Number and a full refund. Hassle-free, guaranteed!



## THREE-YEAR, FIVE-YEAR AND LIFETIME WARRANTIES

We stand behind every product we ship with a three-year unconditional warranty. Some products even have a lifetime warranty! If you wish to have an extended warranty, ask your customer advisor for details.



## \$400 WORTH OF SOFTWARE FREE WITH OUR STORAGE PRODUCTS

Every Focus quality drive includes Virex, Citadel, Drive 7 and Complete Undelete, a \$400 value, free! It's our way of thanking you.



## EASY TOLL-FREE ORDERING

We've made it easy to order from Focus. Call us at (800) 538-8866, Monday through Friday, 8am to 9pm, Saturday and Sunday, 11am to 5pm EST. Our knowledgeable customer advisors will help you pick the right model products for your system. Orders placed by 4 PM can take advantage of our \$9.99 overnight service on "in-stock" items. Please have your credit card number and its expiration date and shipping address ready.



## FOCUS FAX FACTS

For more product information, fax us at 617-938-7741 with your name and fax number. Request product specifications and pricing by listing the names of the products you are interested in. The information will be faxed to you the same business day. On-line ordering: You can contact Focus or place orders with us electronically. CompuServe: 71075.1262, America On-line: FOCUS TECH, AppleLink: FOCUS.



## US & INTERNATIONAL SHIPPING

We use Airborne Express and UPS overnight service, unless UPS Ground offers overnight delivery to your area. **Saturday delivery is available in most areas at no extra charge.** Please be certain to specify if you wish Saturday delivery. Orders placed on Saturday or Sunday will be shipped the following Monday. There is no shipping on major national holidays, but our orders phones are open. Offer good unless system failure, etc., prevents us from shipping. All US shipments are insured at no extra charge. International orders are shipped via DHL and are sent 3 to 5 days from the time we receive the order.



## MONEY, TAXES, ETC.

We accept all major credit cards, (we do not charge your account until your product ships) Approved Government and University POs, business and personal checks (with check approval — allow 10 days), cashier's checks, money orders, and CODs are also accepted. Massachusetts customers please add 5% sales tax.



# Networking in

TurboNet ST connectors feature traffic indicators that show signal presence and strength.



**5 Times The Distance** TurboNet ST™ connectors for LocalTalk™ networks offer plenty of time-saving features: Traffic indicator lights give you instant feedback about signal presence and strength. Distributed Signal Dependent Damping provides improved signal quality and fewer termination problems. You'll gain extended network length, too. TurboNet ST supports distances of up to 5,000 feet compared to LocalTalk's 1,000-foot limit. It's 100% compatible with all PhoneNET™, LocalTalk, and other third-party connectors, and supports star, daisy chain, trunk, or combination network topologies.

**ONLY \$474.99**  
TurboStar

**TurboNet ST Din 8 \$14.99**

**TurboNet ST Din 8, Ten Pack \$119.99**

**TurboNet ST Din 8, Fifty Pack \$499.99**

**TurboNet DB9\* \$14.99**

\*TurboNet DB9 does not have Distributed Signal Dependent Damping or traffic indicator lights.

Manufactured under patent license from Farallon Computing, Inc.

**ONLY \$14.99**  
TurboNet

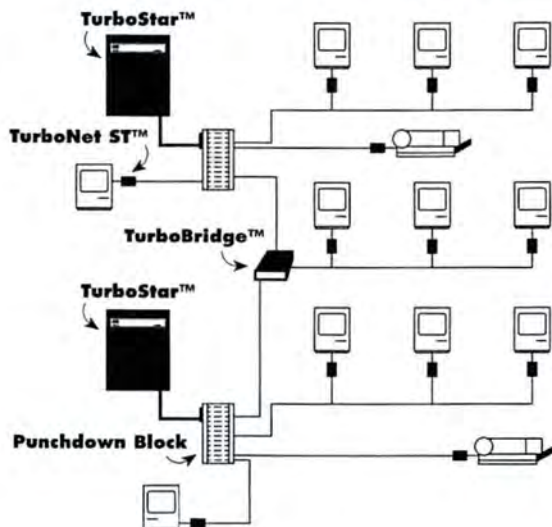


Easily interfaces to existing twisted-pair networks.



Red and green LED indicators let you quickly check the status of all network ports.

## Connecting Multiple TurboStars



**Special Price \$429.99**  
When you order TurboNet 10-pack

## Absolutely The Best Value

Focus TurboStar 16 Port Hub Including Network Bundle

**\$474.99**

compare price with Farallon StarController 12 Port Hub PN307 and PN357

**\$1295** Suggested retail

**\$899** Warehouse price!

\*Prices verified July 16, 1993



# The Fast Lane

"Great management software"  
— MacWEEK



## Smart Hub, Smart Price

The TurboStar™ active hub is a smart LocalTalk hub at an even smarter price. It offers 16 ports that allow four users each (64 users total), with easy-to-read LED indicators for each port.

TurboStar interfaces easily with existing twisted-pair networks, and includes both standard network management tools and Net Utilities by TechWorks.

TurboStar doesn't require a dedicated Mac, so you can manage your network from any Mac on the net. It automatically activates all ports on power-up and assigns them default names. If a defective device causes a port to jam, TurboStar disengages it, then automatically re-enables the port when the jam is cleared. This means less time spent troubleshooting by network managers — and of course, less network downtime. With internal storage for activity logs, a built-in power supply, and a cost-per-port of about \$28, TurboStar is an outstanding value. 10"Wx12"Hx3.5"D

**TurboStar \$474.99**

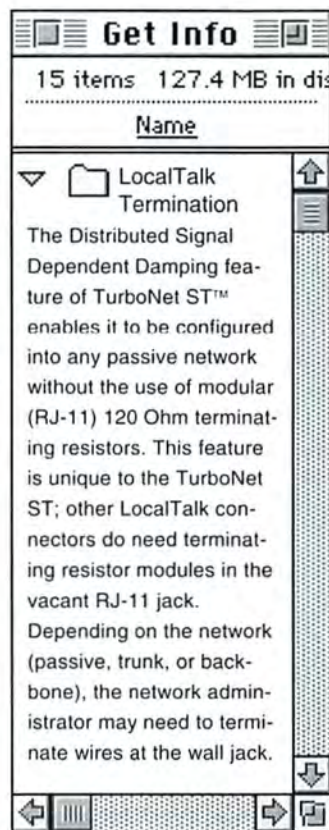
**FREE!**



**Net Utilities** The fantastic Net Utilities software by TechWorks is bundled with every TurboStar! Five separate network applications let you instantly see what devices are active on each port, how busy they are, and what your network load factor is. A \$129 value, FREE!



**The Workgroup Turbocharger** TurboBridge™ network router lets you organize LocalTalk networks into smaller, faster workgroups while improving overall network performance. Use it to connect separate networks, for better information and resource sharing. TurboBridge is simple to install, and uses the Mac's standard Chooser interface for all devices in the network. 5"Wx1"Hx8"D  
**TurboBridge \$199.99**





# Step Up To

## Plug And Play

Step up to the high-speed advantages of Ethernet, and gain full connectivity to the outside world, or just do more, faster, in your office environment. You'll be sending files and accessing network services in minutes with these plug-and-play boards. Our Ethernet boards are fully Apple register compatible and can use Apple's own Ethernet drivers. This means future compatibility with Apple System updates, less headaches for System Administrators, and make them Apple SNMP-compatible. Capable of handling various protocols such as TCP/IP, DECnet, and Netware, EtherLAN boards feature advanced surface mount technology and the latest Ethernet controller chips, such as the ST-NIC from National Semiconductor or the Macronix 83902. Our three-media boards (or two-media in the case of the LC) allow for great networking flexibility. You can quickly change from one Ethernet media to another without re-installing a board. And they come with 64K RAM standard. Make the move to Ethernet now, without worrying about what topology you will have next year!

All LC and IIsi EtherLAN cards include an FPU socket.

All LC cards fit the LC III.



**ONLY \$99.99**  
EtherLAN LC 10BaseT

**ONLY \$139.99**  
3-in-1 NuBus Card

Changes to wiring schemes are never a problem: EtherLAN 3-in-1 cards have connectors for all three media.



## Focus Ether

### 1993 Mac Models

Call for a Focus update on new boards.

We are committed to providing Ethernet connectivity for all Macs!

**Call for a full line of Ethernet cables and accessories!**

### Mac II (NuBus) Series Product Features

EtherLAN II	Thick, Thin, 16K	<b>\$99.99</b>
EtherLAN II-T	Thick, 10BaseT, 16K	<b>\$99.99</b>
EtherLAN A1-II	Thick, Thin, 10BaseT, 64K	<b>\$139.99</b>

### Mac IIsi & SE/30

EtherLAN A1 IIsi & SE/30	Thick, Thin, 10BaseT, 64K	<b>\$169.99</b>
EtherLAN MS IIsi	Pass Thru Slot, Thin, 16K	<b>\$169.99</b>
EtherLAN MS IIsi-T	Pass Thru Slot, 10BaseT, 16K	<b>\$169.99</b>
EtherLAN MS SE/30	Pass Thru Slot, Thin, 16K	<b>\$169.99</b>
EtherLAN MS SE/30-T	Pass Thru Slot, 10BaseT, 16K	<b>\$169.99</b>

All EtherLAN boards for Mac IIsi can be upgraded with FPU.

### Mac SE, A1

EtherLAN SE	Thick, Thin, 10BaseT, 64K	<b>\$169.99</b>
-------------	---------------------------	-----------------



# Ethernet



Front-panel status indicators for power, hub link, and data collision simplify network management.

BNC connector for thinnet, plus 8 10BaseT ports.

**ONLY**  
**\$199.99**  
**EtherLAN Hub/8**



## Extend Your Network

The EtherLAN HUB/8 is a small, self-contained, nine-port Ethernet hub for small workgroups or extensions of larger Ethernet networks. It installs quickly and easily in offices with an existing 10BaseT wall jack or BNC (thinnet) connection and provides one thinnet port and eight 10BaseT twisted-pair ports. The HUB/8 features auto-partitioning and auto-reconnect, and can be cascaded or daisy-chained. No management software is required — just connect it and forget it! 7"Wx1.5"Hx6"D

**EtherLAN HUB/8 \$199.99**

*Absolutely*

## The Best Value

	<b>FOCUS EtherLAN A1-II</b>	Asanté MacCon 3	Farallon EtherMac II-C
NuBus, Thick, Thin & 10BaseT			
Retail Price	<b>\$139.99</b>	\$299	\$249
Controller Chip	<b>Macronix<sup>2</sup></b>	Nat'l ST-NIC	Nat'l ST-NIC
RAM	<b>64K</b>	64K	64K
Data Bus	<b>32-bit</b>	32-bit	32-bit
Surface Mount	<b>Yes</b>	Yes	Yes
Fuse	<b>Yes</b>	No	Yes
Apple Register Compatible	<b>Yes</b>	Yes <sup>1</sup>	Yes
Made in USA	<b>Yes</b>	No	Yes
Diagnostic Software	<b>Yes</b>	Yes	Yes
General			
30-Day Money-Back Guarantee	<b>Yes</b>	No	No
Warranty	<b>Lifetime</b>	5 Years	Lifetime
Tech Support 7 Days a Week	<b>Yes</b>	No	No
Apple SNMP Compatible	<b>Yes<sup>3</sup></b>	Yes <sup>3</sup>	Yes <sup>3</sup>

1. Not all Asanté boards are Apple Register Compatible.

2. Macronix chip is pin compatible to National ST-NIC controller chip. Adopted by Cabletron and Hewlett Packard. Macronix controller is a Standard Cell design whereas the National is a full custom version. Standard Cell is faster and has a more stable output.

3. SNMP compatibility still requires AppleTalk Connection or TCP/IP Connection from Apple.

\*Prices verified on 7/15/93.

## AN Cards

### Mac LC, LC II, LC III

<b>EtherLAN LC</b>	Thin only, 16K	<b>\$99.99</b>
<b>EtherLAN LC-T</b>	10BaseT, 16K	<b>\$99.99</b>
<b>EtherLAN LC/FPU</b>	Thin, 16K, FPU	<b>\$169.99</b>
<b>EtherLAN LC-T/FPU</b>	10BaseT only w/FPU	<b>\$169.99</b>
<b>EtherLAN A1 LC</b>	Thin, 10BaseT, 64K	<b>\$139.99</b>
<b>EtherLAN A1 LC/FPU</b>	Thin, 10BaseT, 64K, FPU	<b>\$199.99</b>

### Ethernet Board Upgrades

<b>FPU/IIsl (20MHz)</b>	Math Coprocessor Upgrade*	<b>\$79.99</b>
<b>FPU/LC (16MHz)</b>	Math Coprocessor Upgrade*	<b>\$74.99</b>
<b>64K RAM Upgrade</b>	For IIsi/NuBus	<b>\$19.99</b>

\*All IIsi and LC boards include an FPU socket; just plug them in!



## Ethernet Has Ne

NEW!

**EtherLAN Print** Easily bridge your LocalTalk LaserWriters to an Ethernet network. Get a fast, plug-and-play solution with the new EtherLAN Print. EtherLAN print works with any brand of LocalTalk compatible network printer or other LocalTalk devices such as Macintosh computers and network modems. With a BNC connector for thinnet and RJ-45 connector for 10BaseT, you have the ultimate in network flexibility. Supports Phase 1 and Phase 2 AppleTalk so any Ethernet user can access LocalTalk devices from any zone and includes an easy-to-use security and management software utility. Choose between the EtherLAN Print which supports two printers or the EtherLAN Print-Plus which supports up to six LocalTalk devices.

5.5"Wx1.5"Hx9"D

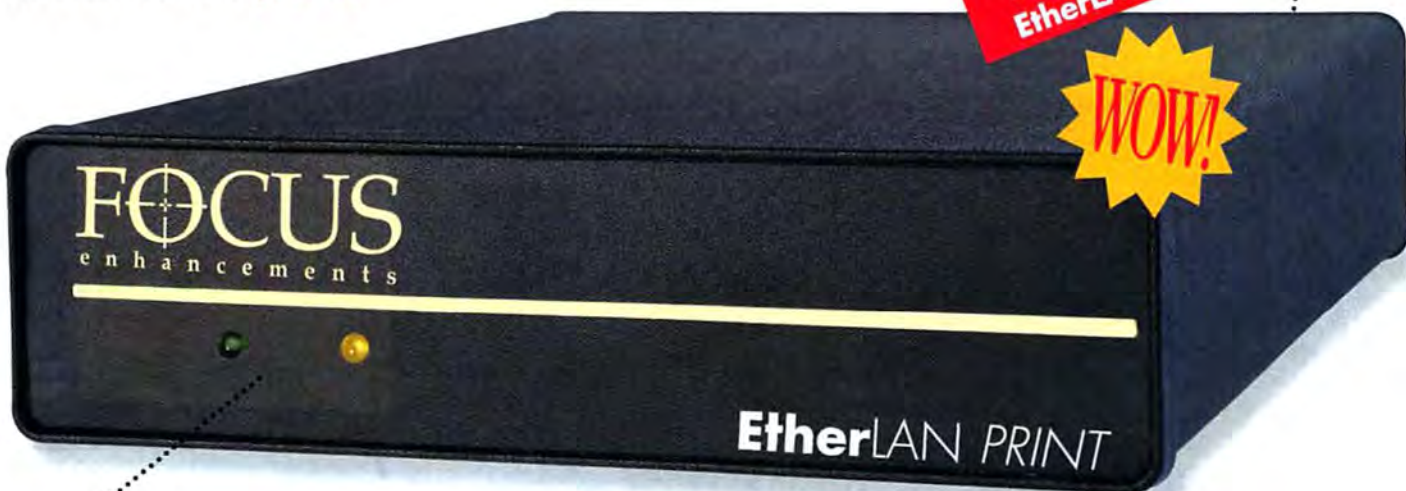
**EtherLAN Print \$299.99**

**EtherLAN Print Plus \$399.99**

Auto-sensing thin and 10BaseT connections for networking flexibility.

ONLY  
**\$299.99**  
EtherLAN Print

WOW!



Activity and power lights indicate the proper functioning of the device.

About the size of a modem.

**Plug Into On-Board Ethernet** Focus transceivers allow you to use the on-board Apple Ethernet port in high-end Macs and Apple printers (sometimes referred to as "Friendly-Net"), to take advantage of Ethernet speeds without the additional purchase of an Ethernet network interface card. Attaches in seconds to a thinnet backbone or versatile 10BaseT network.

LEDs give you a full status for twisted-pair networking.



The EtherLAN Combo Transceiver provides the ultimate in flexibility at a great price.

**Thinnet And 10BaseT** The EtherLAN Tr/Combo is both a thinnet and 10BaseT transceiver for Apple Ethernet Cable Systems.  
**EtherLAN Tr/Combo \$79.99**

Auto termination allows you to add or remove Macs with no disruption to network users.





# Ever Been Easier



Fast, easy installation  
with the push of a plug  
and the click of a mouse.

Don't use your only slot  
for an Ethernet board!  
EtherLAN SC and SC-T  
give you instant Ethernet  
access via your SCSI port.

ONLY  
**\$199.99**  
EtherLAN SC



Activity LEDs  
display EtherLAN's  
status at a glance.

**Ethernet Through The SCSI Port** Now there's an easy way to connect your PowerBook, IIsi, LC, Classic, SE, Plus, or Portable to Ethernet: through your SCSI port. EtherLAN SC and SC-T are the ideal solution for Macs with no internal slots, and a slot-saving solution for Macs with limited slots.

Fully compatible with Thick, Thin and 10BaseT networks, the EtherLAN SC and SC-T adapters install quickly and easily. Power, configuration, and activity LEDs show the EtherLAN's status. Management and system installation software are included to facilitate network management.

Both the EtherLAN SC and SC-T connect to your Mac via a DB-25 SCSI cable. For Mac PowerBooks, HDI SCSI cables are available. The EtherLAN SC has thick (AUI) and thin (BNC) connectors, while the SC-T has thick and 10BaseT (RJ-45) connectors. Get the high-speed benefits of Ethernet today, and save a slot! 5.5"Wx1.5"Hx7.5"D

**EtherLAN SC \$199.99**

**EtherLAN SC-T \$219.99**

**PowerBook Adapter Cable (HDI SCSI Cable) \$24.99**

*"The fastest of the  
SCSI adapters"*

**- MacUser**

Made to "zero-defect"  
tolerances, these transceivers  
are heavily shielded and are  
class B FCC certified - a higher  
rating than our competitor's.



## **Auto-Terminating Transceiver**

The EtherLAN Tr/FN is identical to Apple's auto-terminating thinnet transceivers. Use it with the unique auto-terminating coaxial cable system and break the thinnet backbone into two segments without bringing down the whole network.  
**EtherLAN Tr/FN \$69.99**

## **10BaseT Transceiver**

Plug and play with the EtherLAN Tr/FN-T from your Apple Ethernet port to a standard 10BaseT network.  
**EtherLAN Tr/FN-T \$69.99**



## **Auto-Terminating Cable**

This EtherLAN thinnet Cable/AT is 100% Apple Ethernet compliant and works flawlessly with the EtherLAN Tr/FN transceiver. Three convenient lengths available.

**2 meters \$18.99**

**5 meters \$21.99**

**13 meters \$39.99**



**YOUR FREE 32-PAGE CATALOG**

Mon-Fri 8am to 9pm  
Sat & Sun 11am to 5pm EST

**800-538-8861**



# Power Up Your Mac

Bring your SE up to speed, 68030 at 25 or 40 MHz with socket for FPU.

Boost your Classic to new heights, 68030 at 25 or 40 MHz, with socket for FPU.

Double Your  
Performance for  
as low as  
**\$379.99**

## Expandable Accelerators

Focus Accelerator cards for SE, Classic, LC and LC II, and Mac II family of NuBus computers are high performance, state-of-the-art, and expandable accelerator cards designed for speed. The cards have built-in caches to dramatically increase the performance of the computer. Additional memory can be added to accelerate the computer even further. Break the 4MB barrier on your older Macs! TurboCards with Motorola's MC 68040 microprocessor are completely compatible with all software that runs on Mac Quadras.

## Accelerators

Model	Processor	Price
Mac SE	030 25 MHz	\$379.99
Mac SE	030 25 MHz w/FPU	\$425.99
Mac SE	030 40 MHz	\$425.99
Mac SE	030 40 MHz w/FPU	\$525.99
Mac Classic	030 25 MHz	\$399.99
Mac Classic	030 25 MHz w/FPU	\$475.99
Mac Classic	030 40 MHz	\$475.99
Mac Classic	030 40 MHz w/FPU	\$575.99
Mac LC	040 25 MHz	\$749.99
Mac NuBus*	040 25 MHz	\$1,499
Mac NuBus*	040 33 MHz	\$1,899

Accelerator prices subject to change.

\* Memory not included.

NuBus 68040 at 25 or 33 MHz.

Give your LC the guts of a Quadra, 68040 at 25 MHz.

Call for pricing on memory for all Macs.

**Focus memory modules** for Apple's PowerBook 100, 140, 145, 160, 165C, 170, and 180 are low-power pseudo-static RAM upgrades, available in 2, 4 or 6MB configurations. Each module has a separate ground plane to improve noise immunity.

**80 Nanos And Faster** Focus SIMMs are high density dynamic RAM memory modules that deliver maximum power and speed to your system. All SIMMs are 80 nanoseconds and faster, built using state-of-the-art surface mount technology. Need additional specs? Call Focus Technical Support.





# Dial-Up Network Access

**Call In To Ethernet** If you're running System 7, you can access your EtherTalk network from anywhere in the world! The revolutionary Rand•E (Remote Access Network Device for Ethernet) lets you use AppleTalk Remote Access (ARA) to dial and connect to EtherTalk networks via any standard modem. Up to three Macs or PowerBooks can access



Ethernet simultaneously. Includes configuration software, password/security, and dial-back features. Own a PowerBook? You've already got ARA. Etherize it with Rand•E!

13"Wx1.5"Hx7"D

**Focus Rand•E 10BaseT only, 110V \$999**

**Focus Rand•E Thick, Thin, 10BaseT, 110V \$1099**  
(International versions available)

**19" Rack-mount Bracket for Rand•E \$49.99**



**ONLY \$999**  
Rand•E

## 14.4 Fax/Modem PowerBook

The 14.4 internal fax/modem gives you all the great features of our external 14.4 in a half-card internal unit for your PowerBook. Includes FAX<sup>Stf</sup> software.

**14.4 Fax/Modem PB \$279.99**



## PowerBook FaxModem 24/96

The Focus FaxModem 24/96 PB offers all the features of our external FaxModem 24/96 in a half-card internal fax/modem for Macintosh PowerBooks. Includes FAX<sup>Stf</sup> software (LC version) and manual, plus QuickLink II data modem software.

**Focus FaxModem 24/96 PB \$99.99**

## The Fastest of the 14.4 Modems

The 14.4 Fax/Modem is a screaming-fast, Group 3-compatible, external send and receive fax/modem offering you 14.4 Kbps fax send and receive speeds, 14.4 Kbps data speeds, auto fall-back to slower speeds, full background operation, and data transfer speeds up to 57.6 Kbps! 5.5"Wx1.5"Hx8.75"D

- V.42 and MNP 2,3,4 error correction plus V.42bis and MNP 5 data compression
- Hayes-compatible
- True "hardware handshaking" flow control cable
- Full version of FAX<sup>Stf</sup>

**14.4 External Fax/Modem \$279.99**



## Ethernet FaxModem 24/96

Here's a compact, lightweight, Hayes-compatible external fax/modem for desktop or on-the-road use. The Focus FaxModem 24/96 gives you 2400 bps data transfers with auto fallback, plus 9600 bps send and 4800 bps receive fax capability.

4"Wx1.5"Hx3.75"D

- Front panel LEDs
- Lightweight power supply
- FAX<sup>Stf</sup> software (LC version)
- QuickLink II data modem software

**Focus FaxModem 24/96 \$99.99**

**ONLY \$99.99**





# Incredible Value



**FREE!**

\$400 worth of software with every purchase of a Focus storage subsystem!



**ONLY \$279.99**  
120MB Horizontal

**120MB To 3 Gig!** Focus fixed drives offer high-quality data storage at great values, in capacities ranging from 120MB to 3 gigabytes! Choose between vertical or horizontal 'zero-footprint' design in Platinum or Black. Your Focus drive includes a SCSI cable, an external terminator, and a three-year warranty. And remember, every Focus storage device comes with Virex, Citadel, Complete Undelete, and Drive 7 — a \$400 value, free! 9.5"Wx2"Hx10.75"D

## Great Things Come In Small Packages

From 120MB to 1 gig, high-speed data access fits neatly beside your Macintosh, taking up less of your valuable desk space. Focus vertical drives come in Black or Platinum, and feature the same industry tested drive mechanism as our horizontal storage subsystems. They're pre-formatted, plug and play, and come with the Focus value-pack of free utility software. Small package, small price, great value!  
2.25"Wx5.75"Hx8.5"D

## The Big Boy XXL

Our largest capacity storage subsystems provide extra-extra-large storage — a whopping 2.1 or 3 gig storage capacity for instant access to large desktop publishing, graphics and database files. The Micropolis mechanism is state-of-the-art and is proven to have the fastest seek time of any large capacity system. Manufactured with classic Focus quality, this killer system offers superior performance at an incredible value.  
7.5"Wx6.5"Hx12"D

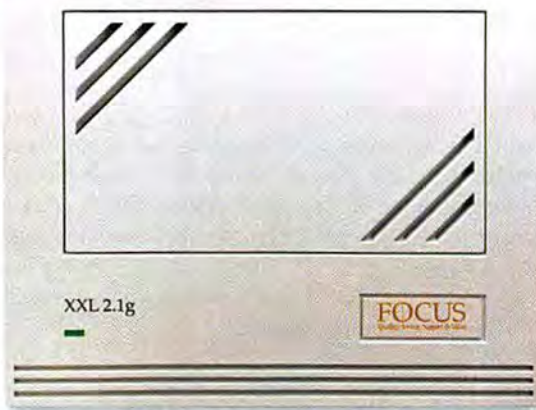
Five-year warranty on Micropolis mechanism for 560MB, 1.2 & 3 gig drives.



**ONLY \$1129**  
1 gig Fixed Drive



**ONLY \$2299**  
2.1 gig Fixed Drive  
**\$2999**  
3 gig



## Focus Fixed Drives

Focus 120MB Fixed Drive	<b>\$279.99</b>	Focus 1 gig Fixed Drive	<b>\$1129</b>
Focus 210MB Fixed Drive	<b>\$399.99</b>	Focus 2.1 gig Fixed Drive	<b>\$2299</b>
Focus 330MB Fixed Drive	<b>\$629.99</b>	Focus 3 gig Fixed Drive	<b>\$2999</b>
Focus 560MB Fixed Drive	<b>\$949.99</b>	All models available in Black or Platinum, Vertical or Horizontal	



# Per-Megabyte



**ONLY  
\$1119**  
128MB Optical Drive



**ONLY  
\$2499**  
650MB Optical Drive

## 128MB Read And Write Optical Drive

Our single-drive 128MB Optical has a high-speed removable optical drive, housed in a compact vertical platinum case. Focus optical drives are *not* read-only or "write once" — they're fully rewritable and erasable, just like standard magnetic media. All Focus optical drives include cables and user's manual; plug them in, slip in a 3.5" optical cartridge, and you're ready to go! 2.5"Wx5.75"Hx9.5"D

## Fast Access 650MB Optical

The Focus 650MO provides massive storage capacity and superior data integrity on 5.25" transportable cartridges that are fully rewritable. This advanced drive features split-head optics and single-step direct seek for faster access times (37ms average). A dust-proof design ensures maximum reliability. ISO standard compatible, uses dual-sided optical cartridges with 325MB of storage on each side. 7.5"Wx6.5"Hx12"D

## Side-By-Side 128MB Optical

The Focus 128MB Optical Duet Drive gives you two side-by-side 128MB optical drives for fast access to larger-than-1.4MB files and easy transfer of large data volumes between compact, 3.5" optical cartridges. Optical drives give you full data transport and security benefits, plus state-of-the-art data integrity for storage and backup. They're ideal for high-volume applications such as desktop publishing, graphics, engineering, imaging, multimedia, and video. 4"Wx7.5"Hx9.5"D



**ONLY  
\$2249**  
128MB Duet Drive



*Absolutely*

## The Best Value

	FOCUS	Mass Micro	PLI
128MB drive	\$1119	\$1489	\$1610
128MB Duet drive	\$2249	none	none
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88MB cartridge	<b>\$89.99</b>	\$189	\$184
Warranty	<b>3 years</b>	3 years	1 year on drives
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Virex	✓		
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Complete Undelete	✓		

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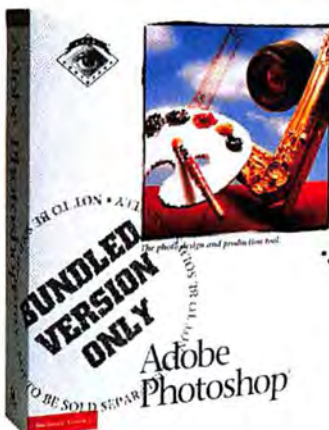
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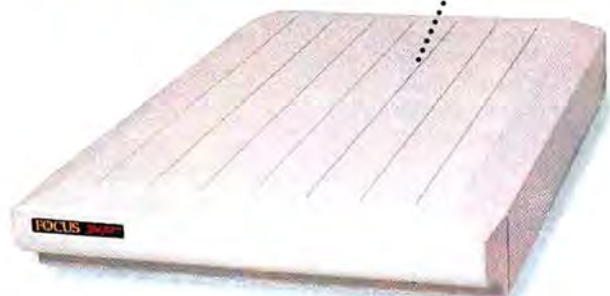


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different users work with different data on different systems, comparing the read/write speed of the two utilities can be difficult. Our tests, performed on both a PowerBook 100 and an LC III, timed file copying as well as the launching and closing of the System file and various application and document files. Initially, it appeared that Stacker was almost 50 percent faster than eDisk. This result was due to the less-than-optimal default settings of the initial eDisk release. However, once we'd adjusted the settings to the currently shipping defaults, eDisk's speed was almost equal to Stacker's. Stacker was noticeably faster than eDisk at reading data, and each product offered a slight speed advantage over TimesTwo 1.03.

When we looked at the overall impact of the two utilities on a Mac's speed, we found that for disk-intensive operations, such as working with large database files, speed can decrease by as much as 40 percent. You're unlikely to notice much difference for most day-to-day operations, however.

In our final point of comparison — compression ratio — eDisk was slightly better at squeezing files than Stacker. On a disk of sample data, eDisk consistently reported ratios of 1.8:1, compared with Stacker's 1.7:1. This is not a spectacular advantage, but it was duplicated consistently across a wide variety of sample data.

eDisk gives you a choice of compression ratios. Alysia recommends the 2:1 setting for most users who store a mix of file types. However, if you use your disk exclusively to store highly compressible files (EPS graphics and database files, for example), you may want to opt for a compression ratio of 3:1 or 4:1 rather than 2:1.

#### Data Safety

Speed and compression ratios aside, the most serious concerns regarding driver-level compression utilities have to do with data safety. If an expanded disk is nearly full, for example, and a compression utility signals to an application that there's more space available than there really is (1 megabyte of expanded space for 500K of physical space, for example), what will happen if the application tries to write more data to the disk than the driver can compress and squeeze onto it?

In order to prevent this problem from

occurring, both utilities become more and more conservative in reporting the amount of free disk space available. When the disk is nearly full, the utility starts to report the *actual* amount of physical free space left rather than the expanded free space. Both manuals point out the potential problem (eDisk's better than Stacker's), and as long as you keep a small percentage of your disks empty (good advice even for normal disks), the risk is small.

An even bigger concern is compatibility of compressed low-level data with data-recovery programs such as Symantec's Norton Utilities or Central Point's MacTools. We inflicted numerous crashes on expanded disks and found that data recovery was not a problem with either compression utility. It simply involved running the installer application and the utility's own low-level diagnostic and recovery routines and then running a disk-recovery program.

However, there is one caveat: The consensus among disk-recovery specialists is that an expanded disk is generally immune to their lowest-level recovery procedures; in rare instances, a profoundly damaged expanded disk may be beyond the reach of even a commercial disk-recovery company.

#### The Bottom Line

If you have a temporary need for more disk space or if you simply can't afford a higher-capacity hard drive, a driver-level compression utility is a worthy solution. However, none of the three packages currently available — eDisk, Stacker for Macintosh, and TimesTwo — is completely flawless. Hard-drive speed is somewhat compromised, and there's a slight risk of losing low-level data that may be crucial to some disk-recovery operations.

Of the three products, Stacker wins for the present. It's quick and simple. With a couple of interface improvements and a less cumbersome installation process, eDisk could be in the same class. And for those who consider the highest compression ratio to be their most important criterion, eDisk has the advantage. But competition in the driver-level compression arena continues to get hotter; as we went to press, Golden Triangle was hard at work on a new release of TimesTwo.

Stay tuned.

— Andy Ihnatko

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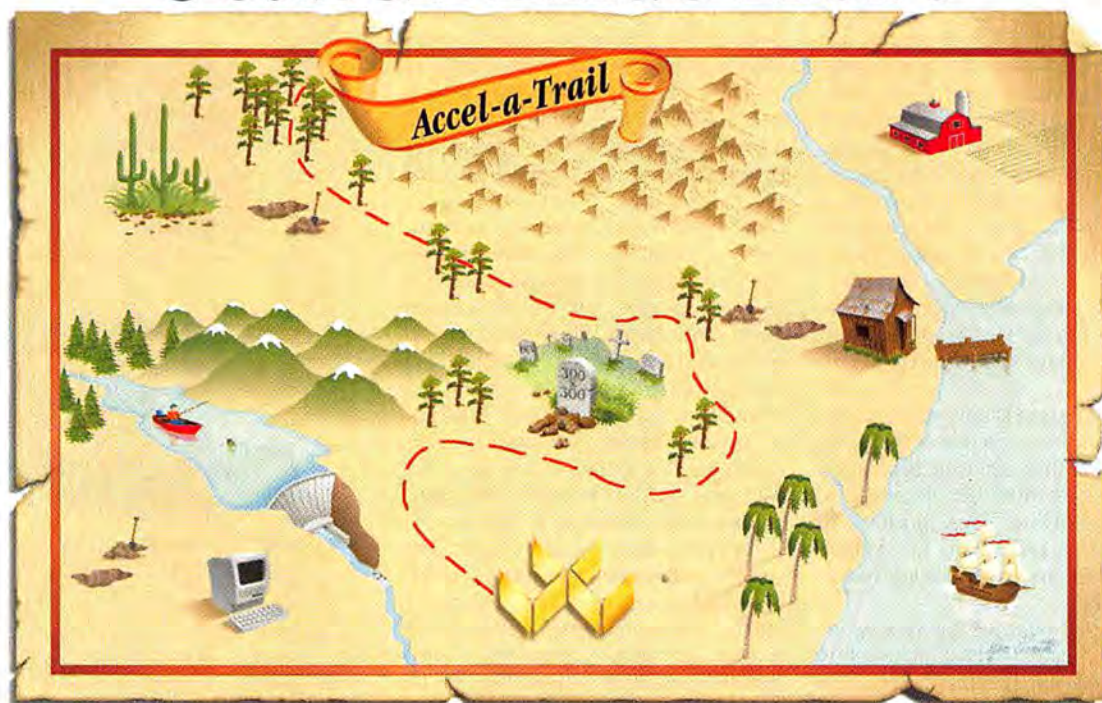
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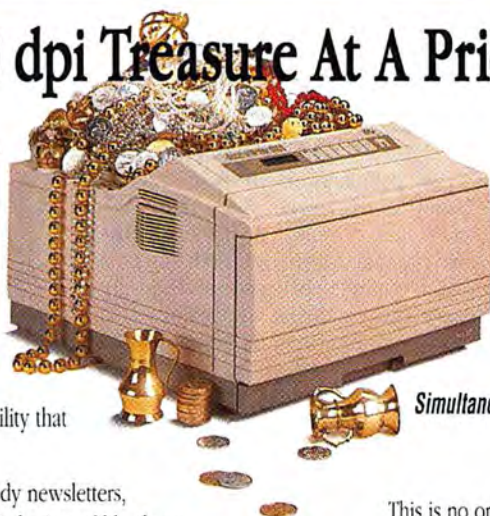
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## UTILITIES

# Colorsqueeze and PicturePress

*PicturePress bests Colorsqueeze with a richer feature set for image compression.*

In a prepress environment, few things tax storage devices and network transmission more than color-image files do. To ease the handling of these huge files—a single full-page image scanned for reproduction at 150 lines per inch and color-separated for printing may be larger than 30 megabytes—professionals can invest in one of two image-compression utilities. Kodak's \$179 Colorsqueeze is solid, but its features pale in comparison to the flexibility and power offered by Storm Technologies' \$199 PicturePress.

## Seeing Is Believing

Colorsqueeze and PicturePress can compress scanned images to a fraction of their original size. Because some image data gets lost in the process, many users consider this *lossy* compression to be a disadvantage. It's not. Each utility works by discarding only data that's relatively unimportant to the eye. With this technique, the utilities can compress images to a 10th or even a 15th of their original size without any *visible* loss of image quality. Some images hold up well even at compression ratios of 30:1 or higher.

PicturePress makes use of the JPEG (Joint Photographic Experts Group)



### Colorsqueeze 2.0

**Published by:** Eastman Kodak Co., 343 State Street, Rochester, NY 14650; 800-242-2424 or 716-724-4000.  
**List Price:** \$179.



### PicturePress 2.5

**Published by:** Storm Technologies, 1861 Landings Drive, Mountain View, CA 94043; 415-691-6600.  
**List Price:** \$199.

compression algorithm, an international standard that's been incorporated into technologies as diverse as Apple's QuickTime and Adobe's PostScript Level 2. Colorsqueeze uses a similar algorithm but creates proprietary KIC files that can't be read by JPEG-aware applications. Colorsqueeze can, however, save files in compressed PICT format by using the JPEG algorithm built in to QuickTime. That means any application that can read PICT files should also be able to open and decompress these files, providing

QuickTime is installed on the same system.

To ease the distribution of image files, each utility also offers free programs that decompress compressed images, making it possible to send compressed images to users who don't have the original utility.

The differences between Colorsqueeze and PicturePress boil down to four considerations: speed, image quality at a given compression ratio, convenience, and supported file formats.

For speed, PicturePress has the clear advantage, especially for large files. With software-only compression, PicturePress is more than twice as fast as Colorsqueeze. Factor in hardware acceleration, and it's even faster: Although PicturePress' maker no longer sells an accelerator card, SuperMac's ThunderStorm and Thunder II cards and DayStar Digital's Charger card automatically accelerate Storm's JPEG compression by two to five times. An additional benefit of hardware acceleration is that the resulting compressed files are somewhat smaller than their software-compressed counterparts. That's because the accelerator cards can handle the math involved with greater precision.

Evaluating the image quality of files compressed by the two utilities is quite a



Will the original uncompressed image please stand up? Both Colorsqueeze and PicturePress compress images to a fraction of their original size by "losing" some of the image data. However, it's virtually impossible to distinguish a compressed

image from its original (the image on the right is a 784K PicturePress-compressed image, the image on the left is the 768K Colorsqueeze version, and the middle one is the 24.5-megabyte original).





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MacUser 4/91

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bit more difficult than comparing speed. Colorsqueeze offers three fixed compression settings: Normal (best quality, lowest compression ratio), Medium, and High (lowest quality, highest compression ratio). PicturePress, in contrast, offers almost unlimited control over image compression: A slider control lets you set the compression level from 1 to 100.

PicturePress also lets you hand-tune the quantization matrices for both the luminance (brightness) and chrominance (color) components of an image, so you can create optimal settings for different types of images. Working with these settings requires a considerable knowledge of how JPEG works, but the standard is well explained in the manual and experimentation will increase your working knowledge immeasurably.

When we used PicturePress settings that produced file sizes similar to those of Colorsqueeze, we could detect no difference between the decompressed images until we enlarged them to at least four times their actual size. At that magnification, we could see *slight* differences but couldn't say unequivocally that one image looked better than the other.

We also did a synthetic comparison, comparing compressed and then decompressed files with their originals by subtracting them in Photoshop. In these tests, the Colorsqueeze files changed slightly more than the PicturePress files, but we lend more weight to the visual results for our final judgment of image quality.

We did find a clear quality difference between PicturePress' JPEG-compressed files and the JPEG-compressed PICT files created by Colorsqueeze acting in concert with QuickTime. PicturePress' JPEG compression resulted in less color shifting and fewer visual artifacts than did QuickTime's.

One significant advantage of PicturePress over Colorsqueeze is that it offers much more flexibility and convenience. Besides the stand-alone PicturePress application, Storm includes a Photoshop plug-in that lets you compress and decompress images directly from within Photoshop. Colorsqueeze, on the other hand, works only with images opened from within the utility itself.

Another PicturePress productivity advantage is that it is Apple-events aware and it includes a run-time version of the UserLand Frontier scripting tool. A pre-built Frontier script lets you drag files into a folder for automatic drag-and-drop

compression. Compressed files are automatically stored in a second folder, and the originals are moved to a third folder after compression — a handy feature.

PicturePress and Colorsqueeze also differ in the file formats they support. Colorsqueeze supports the Kodak Photo CD format, whereas PicturePress does not. However, Colorsqueeze uses its native KIC compression only on 24-bit RGB color images. To compress grayscale images, Colorsqueeze uses QuickTime compression, and it can't compress CMYK images at all.

PicturePress provides broader support. It compresses RGB, CMYK, and grayscale images either from within the application or from within Photoshop, using the plug-in. It saves files in JPEG format or as JPEG-compressed PICT files. A system extension, QuickPress, substitutes Storm's JPEG for Apple's whenever the QuickTime PICT format is used, so any application can take advantage of PicturePress' superior speed and image quality.

With its Photoshop plug-in module, PicturePress can also save JPEG images as EPS files, with or without a preview. You can use the EPS/JPEG format with any application that supports EPS files, but you can print the files only on PostScript Level 2 output devices. The time savings gained by printing EPS/JPEG files to a Level 2 color printer are substantial — printing is three to five times faster than printing the same image uncompressed.

#### The Bottom Line

Both Colorsqueeze and PicturePress offer a viable means of shrinking unwieldy image files *without* compromising image quality. Colorsqueeze is straightforward to use but slow. Moreover, it lacks the flexibility PicturePress offers. PicturePress is a complete JPEG system powerful enough for professional users and simple enough for novices. The addition of the Frontier run-time module and script turns batch compression of images into a drag-and-drop operation, and the Photoshop plug-in enables Storm's JPEG compression to be applied to almost every image format known to the Macintosh. For demanding users, the availability of hardware acceleration makes PicturePress an even better choice, for a cost that's only slightly higher.

— Bruce Fraser



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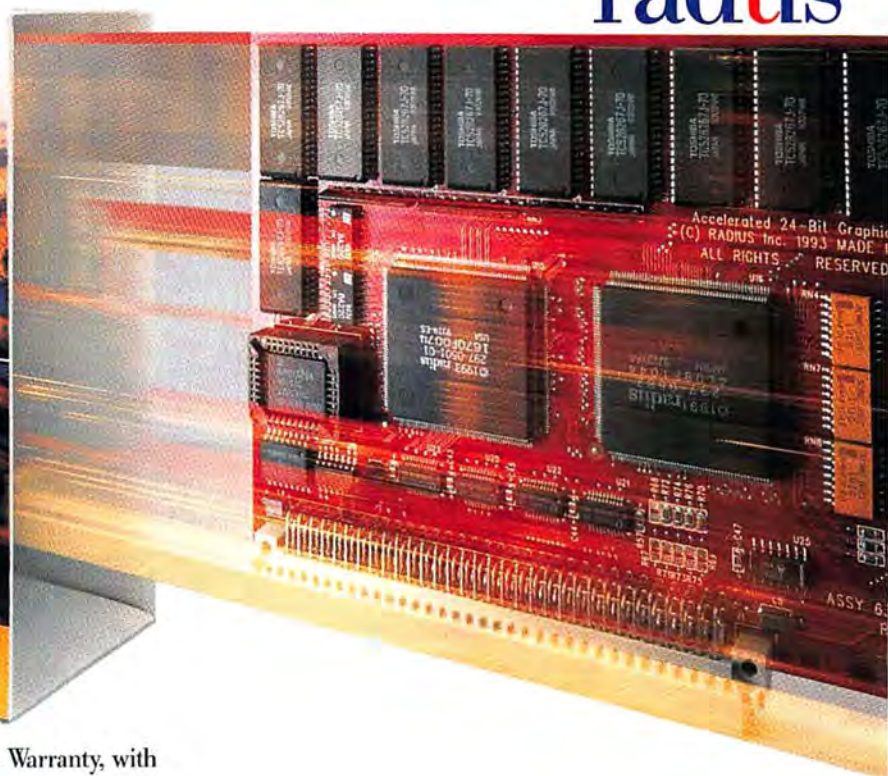
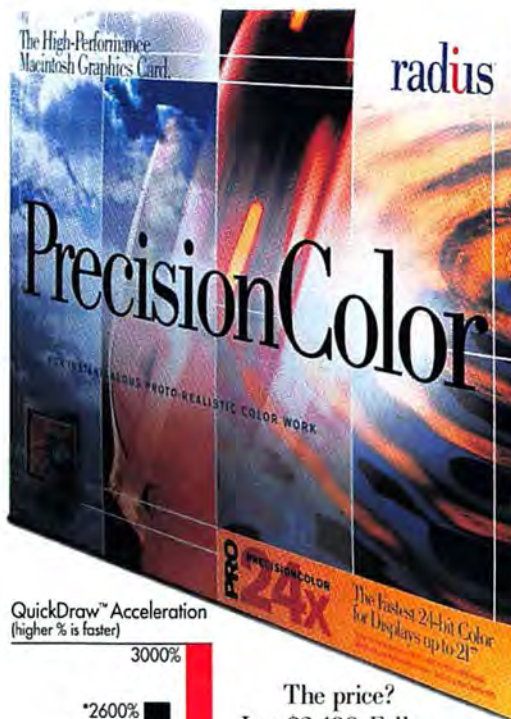
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 27717; 919-490-1277.  
**List Price:** Twin Pak, \$99.95;  
 Unlimited Zone Pak, \$299.

over phone lines with modems. The program initially presents you with a dialog box that lets you select the machine you want to control, the method of connection (serial or AppleTalk), and the connection port (modem or printer). Once

you're connected to a host machine, you can view a bit-mapped representation of its screen, control its operations remotely, and even exchange files.

ScreenLink displays the host's desktop in a resizable, movable window with a heavy black border. The window provides full Finder access to the host Mac. ScreenLink doesn't support color — in general, if the host display is in color, ScreenLink substitutes white for light colors and black for dark.

You can set access privileges for host as well as guest machines with ScreenLink's Security Preferences dialog box. A case-sensitive password is required

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EtherWave cost comparison*	
Hub and card	\$789
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Cost per node. (Includes pulling wire.)	
*The Yankee Group, 1993	

You need to add a node. And fast. But there's not a port available. That's why EtherWave products contain two self-terminating RJ-45 ports. So you can "daisy-chain" Macs, PCs,

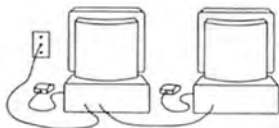
PowerBooks and printers from a single hub port or wall jack. Saving you the hassle—and tremendous expense—of pulling more cable.

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EtherWave also lets you quickly create small, ad hoc Ethernet networks without a hub. It's great for temporary workgroups. These networks can contain up to eight nodes, and can be connected to larger networks.

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Now it's finally simple, reliable and affordable to add these types of devices—even the new Newton MessagePads—to Ethernet. Just plug the EtherWave adapter into the device's LocalTalk port, and connect it to another Mac, PC, or to a hub. For Macs and



Only EtherWave technology lets you "daisy-chain" 10BASE-T nodes from a single hub port or wall jack.

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# Farallon users shape of Ethernet.

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All EtherWave transceivers, cards and adapters are built with everything our customers asked for—100 percent 10BASE-T compatibility first and foremost. Plus self-terminating ports, so you can add nodes without disrupting the network. A robust set of diagnostic LEDs. And power-off pass through, so shutting off a node doesn't shut off the network.

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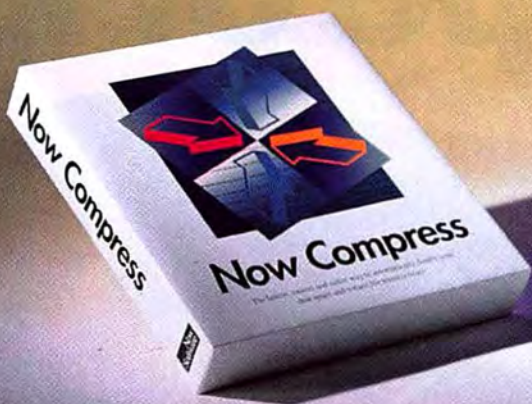
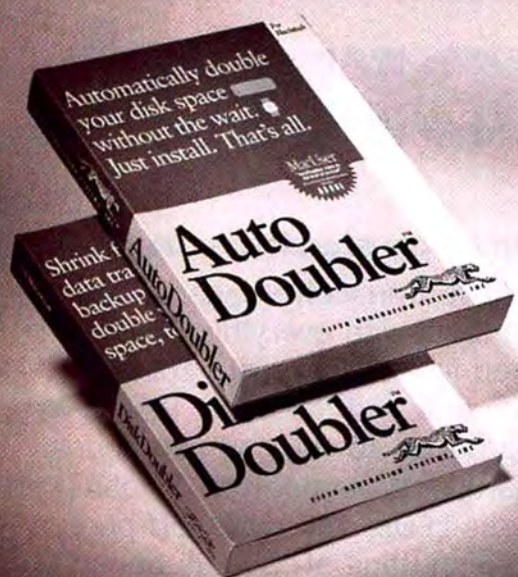
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In the Now Software tradition, we've humanized the interface to make it far simpler to use than other compression products.

File Name	Original	Compressed	Saved	Status	Creator	Type	Label	Last Modified
1992 Year-end Report	10.0K	5.0K	42%	Compressed	FEVD	VSDM	None	Fri, Jan 29, 1993
1992 Year-end Report	42.5K	19.5K	45%	Compressed	FEVD	VSDM	None	Thu, Feb 25, 1993
Yearbook.doc	417.5K	9.4K	78%	Compressed	FEVD	VSDM	None	Thu, Aug 27, 1992
Newsletter/Jan 93	100.2K	25.4K	75%	Compressed	FEVD	VSDM	None	Fri, Sep 11, 1992
Product Description.doc	254.7K	-	-	Archived	FEVD	VSDM	None	Thu, Feb 25, 1993
01.93 (Objectives)	6.5K	-	-	Archived	FEVD	VSDM	None	Mon, Feb 1, 1993
Team Photo.TIF	235.3K	34.4K	84%	Compressed	FEVD	VSDM	None	Fri, Jan 15, 1993
Compressed: 5 of 7	712.9K	350.0K	50%	-	-	-	-	-

Note the Inspector window on the left. It lets you see the status of any file, folder or

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for accessing these preferences. ScreenLink allows several levels of guest access to host machines — view-only privileges, control of the host's operations, file transfer from the guest to the host, and file transfer from the host to the guest. You can create a different set of controls for each guest and view, modify, and delete them from a scrolling selection window.

The Security Preferences dialog box provides other controls as well. It lets you set a host to become active at startup. You can protect host-system folders from modification by guests and enable a dialog box that lets the host user control guest access. In addition, the CallBack feature enables the host to verify calls from guests. To do so, the host breaks a remote-modem connection as soon as it's established and dials back the guest, verifying that the guest is at the preset number for that user name. ScreenLink also lets you use the bundled Virex extension software to scan files as they're transferred between host and guests.

ScreenLink's security controls are adequate, but they don't offer a fine level of control over host access. You can't, for example, allow guests to view and copy host files but restrict them from modifying the files. In short, ScreenLink's access permissions are no substitute for the better controls you get with file sharing under System 7 or with a network operating system such as AppleShare.

In theory, you can have an unlimited number of guests connected to a single host simultaneously, although only one guest at a time can control the host. When one guest relinquishes control, another can take over. This makes ScreenLink a good choice for training and classroom laboratory situations in which users need to view the instructor's screen from connected Macs.



ScreenLink lets you access and control one Mac from another over an AppleTalk network or over phone lines with modems. Here, a guest Mac controls an application on a host machine. The host's screen appears on the guest's desktop in a movable, resizable window with a heavy border.

#### File Transfers

File transfers between host and guest are initiated by the guest. A familiar-looking File Transfer Browser displays the host's disks and folders in one scrolling window and the guest's in another. The Send and Get buttons let you direct

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the transfer to the proper location. In order to help speed file transfers over LocalTalk or modem connections, ScreenLink provides a file-compression option. Compressed files are automatically decompressed by ScreenLink as they are received.

ScreenLink's primary competitor is Farallon's Timbuktu 5.0. Timbuktu's longer history on the Mac and its many revisions make it a better overall product than ScreenLink. A Windows version of Timbuktu lets a Mac control a PC and vice versa, so Timbuktu is the better choice for mixed Mac/PC environments. In addition, Timbuktu supports color, provides snappier screen response, and displays menu-bar status icons that keep you informed about who is doing what to your host machine.

However, Timbuktu is also more expensive than ScreenLink. For \$299, you can purchase a version of ScreenLink that covers all the Macs on a single AppleTalk zone. Timbuktu, on the other hand, is priced according to the number of

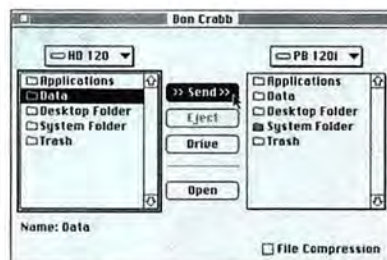
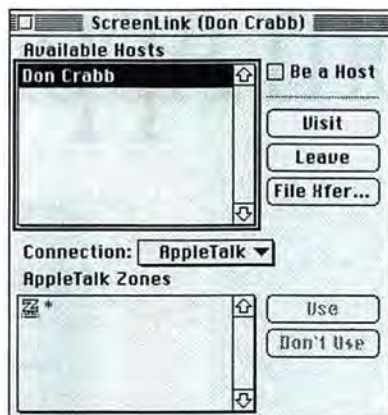
licensed users — 2 for \$299, 10 for \$999, 30 for \$1,999, and 100 for \$5,500 — substantially costlier. ScreenLink comes with the Virex antiviral extension.

### The Bottom Line

For those people who need remote-control and screen-sharing software, ScreenLink is a solid product that's easy

on the budget. It's not as full-featured or as slickly implemented as rival Timbuktu. ScreenLink lacks Timbuktu's color support, fine-tuned controls over host access, and cross-platform features. But ScreenLink gets the job done at a price that can't be beat, making it ideal for classroom labs.

— Don Crabb



With ScreenLink's main window (left), a guest can gain access to a host by selecting the host's name and clicking on the Visit button. The window above provides controls for file transfers between host and guest Macs.

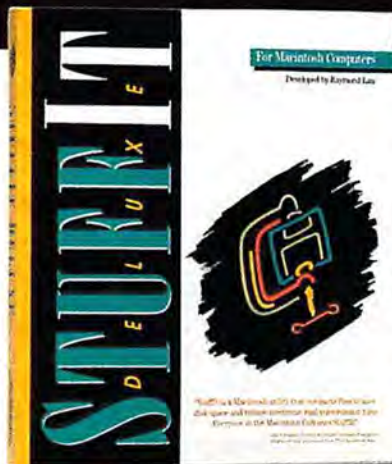
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## QUICK CLICKS



## On The Road



The main strength of the PowerBook is also one of its problems: You can work almost anywhere, without being plugged in to anything. So what happens when you want to print or fax something? You can make yourself a to-do list and print or fax the items later. You can even use background printing to spool print files to disk until you're near a printer — but then you still have to check that to-do list. Or you can use Palomar's On The Road to automate the process.

With On The Road's deferred printing and faxing, you work as if you were connected to a printer and a phone line; that is, you choose your Print or Fax command when your document is ready. But instead of a Print or Send button in the dialog box, you get a Defer button. Clicking on it spools the document to disk for On The Road to handle later.

Any time your PowerBook starts up or wakes up, On The Road does its best to find out where you are. It looks at network connections, printer names, mounted AppleShare volumes, and external monitors — plus it uses previous information and experience. If the right printer is available, it prints the spooled documents; if a phone line's attached, it faxes the waiting items. If On The Road can't figure out where you are, it asks you. You can store as many named locations as you want — "At home," "At work," "Dialed up to work," and so on — where each location corresponds to a distinct set of connected devices.

When you spool your print documents, On The Road looks for the printer you've specified in the Chooser. You can defer printing to your office printer, one at home, and one at a client's office, and the correct documents get printed at each location. You can also force a spooled document to print to a current printer at any time, as long as it uses the same printer driver as the one you sent it to originally.

On The Road stays in your menu bar, signaling its actions (ascertaining a location, looking for a phone line, and checking for a printer) by changing its icon. Its menu lets you turn deferred

printing and faxing on and off and lets you set AppleTalk to load at startup. As a bonus, it turns AppleTalk on and off automatically, based on your network connection.

In all, On The Road takes a simple idea and turns it into an elegant, handy utility for PowerBook users.

Palomar Software, 2964 Oceanside Blvd., Oceanside, CA 92054; 619-721-7000. Version 1.1. \$99.

— Sharon Zardetto Aker



## MACphoto-grapher



Imagine a teaching camera that can develop an entire roll of film (well, *virtual* film) on the spot and critique your technique as well. That's the idea behind MACphotographer, a camera-simulation software package from Kodak that also includes a database of photography-related information.

Photo Workshop, the main application in MACphotographer, puts the viewfinder of a virtual 35mm camera on your screen, with a simulated-reality scene, such as moving boats, visible in the center. Surrounding this scene are a variety of camera controls, from basic (camera position, film speed, aperture) to more advanced (depth of field, metering, flash, exposure compensation, bracketing, and so on), depending on the level of expertise you choose.

At the advanced level, you can select from a long list of lenses, including powerful zooms and telephotos (although in some scenes, your creativity is limited by a narrower choice). To help you make selections, there's a Help/Reference option, which provides access to a wide range of topics, although some are cursory in their treatment of a subject.

Unfortunately, the scenes provided for photographing — especially the action scenes — are low-resolution images, so they don't look very realistic (QuickTime movies or a separate disk with images would be an improvement). Once you've taken your pictures (by clicking in the scene or pressing the space bar), MACphotographer "develops" them quickly and displays them in an album-page format.

The commentary provided for each photo is more helpful than the visual image, given the poor image quality. You

can choose a basic or in-depth commentary, but we found the basic commentary (of focusing, shutter speed, and so on) more to the point. The in-depth review uses broad definitions that can be confusing, and it plugs Kodak film relentlessly — did we mention that you can load only Kodak film in your virtual camera?

The Kodak Database included in MACphotographer is also Kodak-centric, but it's a good resource for any photographer. The Kodak Database includes information on film and exposure that used to be available only in professional-photography books.

Despite its low-resolution images and Kodak plugs, MACphotographer is a helpful and instructive product for beginning and intermediate photographers who want to know more about what their cameras can do. Although it's no substitute for real camera time, it teaches how thinking before you trip the shutter can save you time and money afterward — a lesson many pros learn the hard way.

Eastman Kodak Co., 343 State Street, Department 412-L, Rochester, NY 14650; 716-724-4000. Version 1.0. \$59.95.

— Peter Alan Gould



## CLImate



If the Mac's friendly desktop can't keep you from sometimes longing for the efficiency of a CLI (command-line interface) such as that of DOS or UNIX, Orchard Software's CLImate might be just the utility for you. Then again, it might not. Although CLImate offers a CLI and a scripting language, there are many things it can't do or doesn't do well.

CLImate provides a CLI that works alongside the Finder's graphical user interface. You use an English-like language to list directories, copy and delete files, run applications, format floppy disks, and so on. In addition to a basic set of commands that parallel Finder operations, CLImate includes a scripting language that's a subset of the venerable programming language BASIC. CLImate's BASIC dialect supports moderately advanced features such as loops, conditionals, and subroutines, but it requires line numbers — a clunky approach.

To make CLImate run under System



**NEW ON THE MENU**  
**QUICK CLICKS**

6.0.5 and later, Orchard chose not to support System 7's Apple events or any form of IAC (interapplication communication); CLImate is unlike such scripting environments as UserLand's Frontier or Apple's own AppleScript in this respect. Whereas the latter systems' strengths lie in linking disparate applications through IAC, CLImate can script only the Finder's file-manipulation functions.

For scripting Finder operations, CLImate works well, but its interface has limitations. CLImate lacks an easy means of reentering previous commands — a feature of UNIX, Amiga, and even DOS shells; instead, it requires a select/copy/paste/edit cycle. Also, although CLImate's EXEC command can run any application, you can't specify that a particular document be opened. Nor is it possible to quit running applications or interact with them (except applications, such as StuffIt Expander, that you can influence by placing files in specific directories), because CLImate doesn't support IAC.

CLImate can be useful if you want a CLI to facilitate or automate simple file-manipulation tasks such as copying groups of files. For more-complex system scripting, though, you'll have more success with Frontier or AppleScript.

Orchard Software, Inc., P.O. Box 380814, Cambridge, MA 02238; 617-876-4608. Version 1.0.2. \$59.95.

—Jeffrey Sullivan



## **Out of This World**

★★★★½

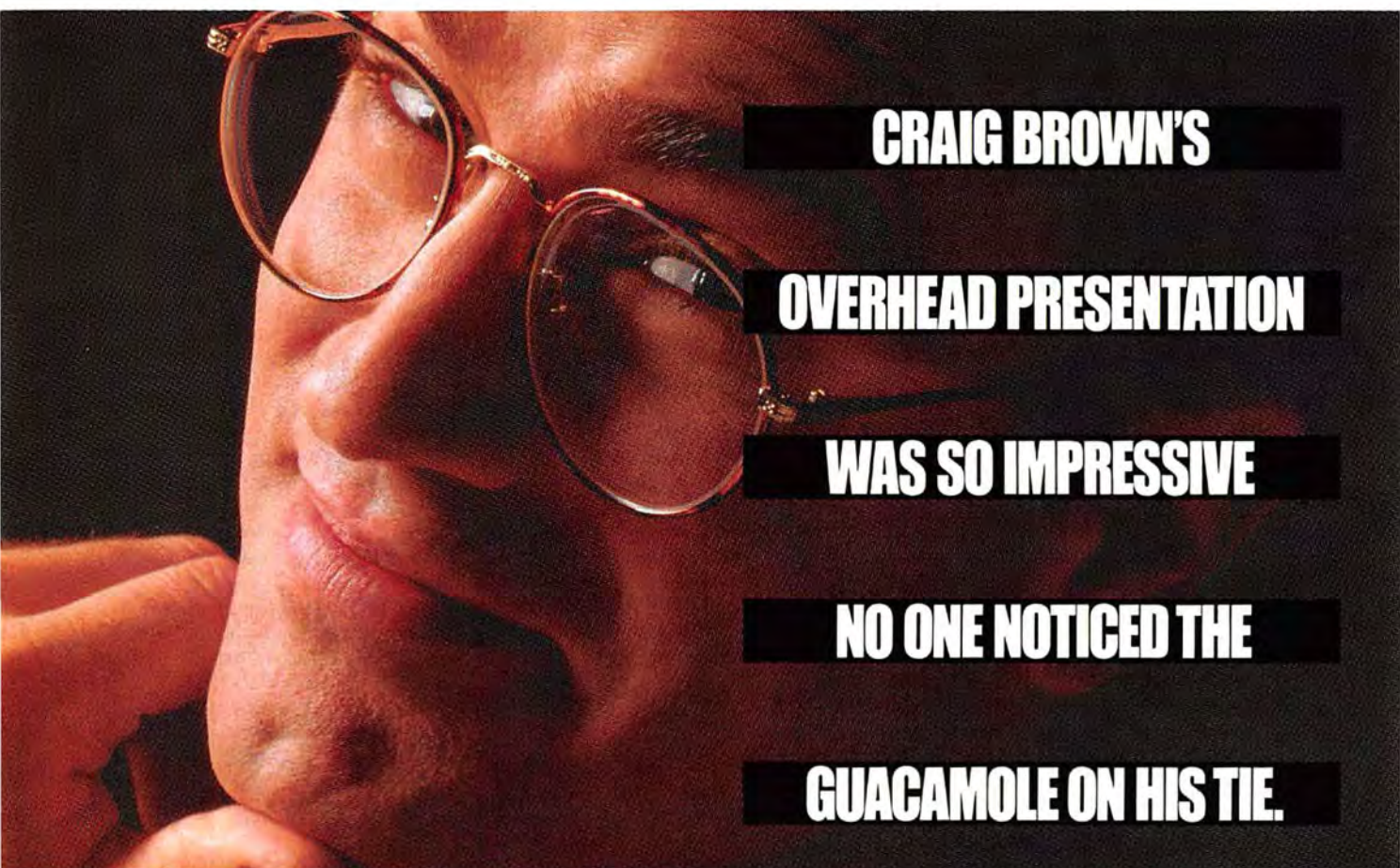
Ready for a fantastic trip to another dimension? As its name implies, MacPlay's Out of This World can take you there. It's an action adventure game that's guaranteed to keep you glued to your Mac for hours.

In a nuclear experiment gone wrong, you find yourself transported through time and space to another dimension — a place where ferocious beasts and armed

aliens are out for your blood. Your only ally is a friendly alien who helps you get out of tough spots from time to time.

This game requires a perfect balance of arcade-style hand/eye coordination (timing your jumps, firing at enemies, deflecting their hits) and problem-solving abilities — your surroundings are much like a maze, and the obvious ways of getting to the next level seldom work. Fortunately, the keyboard controls are simple; you can also use an Advanced Gravis MouseStick for maneuvering. If you happen to die during the course of the game (and you will — many times), you get a four-letter pass code that lets you return to life at the location of your demise instead of starting over.

The animation in Out of This World is first-rate. The program uses polygonal (vector-based) graphics, which provide smooth, fluid animation although not a lot of fine detail (which is no great loss, given the pace at which the game travels). For optimum speed, you can match your Mac's horsepower to one of four



**CRAIG BROWN'S**

**OVERHEAD PRESENTATION**

**WAS SO IMPRESSIVE**

**NO ONE NOTICED THE**

**GUACAMOLE ON HIS TIE.**



possible window sizes for the game — the smaller the window, the faster the animation. A continuous soundtrack provides plenty of brooding atmosphere and entertaining sound effects. The game's best feature, though, is how it pulls you in: It reaches out and grabs you, and it won't let go.

MacPlay, 17922 Fitch Avenue, Irvine, CA 92714; 714-553-3530. Version 1.0. \$59.95.

— Tony A. Bojorquez



## OffLine



OffLine is a nifty little utility that keeps track of what's where on floppy disks. The interface could use a little fine-tuning, but even in its current form, OffLine is a workable way to track your off-line storage.

OffLine makes catalogs of the files and folders on floppy disks. You can create as many catalogs as you want —

one for the backups of your financial records, one for your font disks, and so on. All you have to do is feed the disks in, one after the other. In seconds, OffLine reads the contents into the catalog and spits the disk out, ready for the next. Get Info comments attached to any of the files are preserved — and files in StuffIt, Compact Pro, DiskDoublers, and AppleLink formats are logged according to the items *inside* the compressed file.

OffLine could use a little interface polishing. Browsing isn't straightforward, because the files in the catalog aren't listed in the main window; you have to double-click on a disk name to open a separate dialog box. Also, you have to set export preferences in a separate dialog box instead of through pop-up menus in the Export dialog box, and the main window disappears when the Export dialog box opens. But these are minor annoyances, not major problems.

You can search for a file in either of two modes: Basic, in which you give all or part of the filename and can specify

the application that created the file, or Advanced, in which the search criteria can also include the file's label, its creator code, and the file type. The search speed isn't blinding, but it's respectable: about 10 seconds to select 22 matches in a 1,400-item catalog.

OffLine includes some helpful touches: It checks whether the disk you're inserting is already cataloged and, if so, updates its information instead of duplicating it; it lets you append files with brief comments that are stored only in the catalog and are unrelated to the Get Info comments; it exports catalog information in text files; and it prints disk labels with file information on them.

OffLine could use a little refining and a few more features — such as internal printing of catalog lists, so you don't have to export the information to print it — but it's still a useful utility.

SNA, Inc., 2200 N.W. Corporate Blvd., Boca Raton, FL 33431; 407-241-0308. Version 3.0.3. \$99.95.

— Sharon Zardetto Aker



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# THE TOP 50 CD-ROMs

With hundreds to choose from, how can you tell which CD-ROMs are worth the bucks?

Here are the 50 best we've seen to date. **BY THE EDITORS OF MACUSER**

**H**ow do you start an information explosion? Begin by introducing QuickTime, a new data format that makes it easy to distribute movies and animations. Go on to bundle CD-ROM drives with Apple Performas. And for good measure, make CD-ROM drives (yes, even Apple's) significantly faster and cheaper.

All those things happened in the past couple of years, and suddenly you can't turn around without bumping into a new CD-ROM about anything from dinosaurs to the Beatles. Two years ago, when *MacUser* last surveyed the offerings for CD-ROM-drive owners ("Silver Platters That Matter," June '91, page 170), we could find only two-dozen discs worth mentioning. Now, after sifting through hundreds of available titles, we've had to limit ourselves to selecting only the top 50 as potential additions to your collection. And new titles are being introduced every week.

As before, we've largely excluded discs that merely use CD-ROM as a delivery medium for software. Thus, you won't find The Microsoft Office (a best-selling collection of Microsoft business applications) or consolidated image collections such as 3G Graphics' excellent Images with Impact! (although we did slip in a couple of image-based discs that have special cataloging features). Also missing are collections of QuickTime movie clips — which wouldn't be possible without the capacity (as much as 650 megabytes) of CD-ROMs. Finally, we haven't included collections of shareware, freeware, and public-domain-software libraries — such

as the ones offered by BMUG (510-549-2684), the Boston Computer Society (617-252-0600), and Pacific Hitech (801-278-2042) — even though they're among the best bargains.

What you *will* find are CD-ROM titles that range from the educational to the eclectic to the electrifying. Whether you're looking for something to encourage your child to read, to teach you a new language, or simply to satisfy your own curiosity about interactive media, these CD-ROMs will make it happen.





## A Hard Day's Night

### 1. A Hard Day's Night

The Voyager Company; \$39.95.

★★★★



Beatles fans and movie fans in general will flip over **A Hard Day's Night**, which manages to pack the entire 1964 film, its screenplay, and lots of extra goodies on one CD-ROM. You can watch the Fab Four's film debut with your left eye while your right eye follows along with the screenplay, seeing what dialogue and scenes were cut and what was ad-libbed. This disc shows just how good CD-ROM can be — and it's a great movie too!

### 2. The San Diego Zoo Presents... The Animals!

The Software Toolworks; \$99.95.

★★★★



You'll find it hard to believe the wealth of QuickTime movies, photos, animal sounds, stories, and well-written information The Software Toolworks has stuffed

into **The San Diego Zoo Presents... The Animals!** This multimedia tour of the San Diego Zoo explores the lives and habitats of more than 200 animals, depicted in 1,300 photos and an hour of video clips. The software safari is lucidly explained in 2,500 carefully cross-referenced pages and presented in a polished package of handsome graphics.

### 3. How Computers Work

Time-Warner Interactive Group; \$79.99.

★★★★½



Based on the Time-Life books *How Things Work* and *Understanding Computers*, **How Computers Work** is an easy-to-follow interactive guide to what's under your computer's hood. With its on-line textbook, a time line showing high points in the development of the computer, a peek at future trends, and activities ranging from knowledge tests to a programming exercise, this is an entertaining and educational tool for curious adults and teenagers.

KEY	
	Educational
	Great for kids
	Superior sound
	Features QuickTime

### 4. Criterion Goes to the Movies

The Voyager Company; \$24.95.

★★★★½



At first glance, **Criterion Goes to the Movies** looks like a promotional catalog for the Criterion Collection of video laserdiscs. But because that collection includes 150 of the best movies ever, this CD-ROM full of QuickTime clips becomes a joy for any movie fan. Click on *Five Easy*



### How Computers Work



### Criterion Goes to the Movies



## CD-ROM Top 50

*Pieces*, and watch Jack Nicholson tell a waitress to hold some chicken between her knees. High-quality stills of all major cast members and a short essay are standard issue for each of the films on the disc.

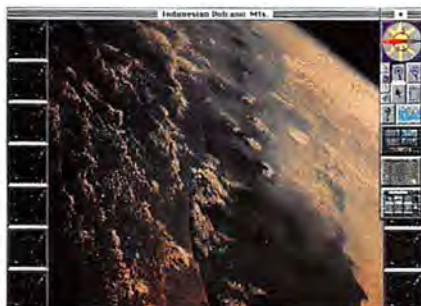
### 5. Small Blue Planet

Now What Software; \$159.

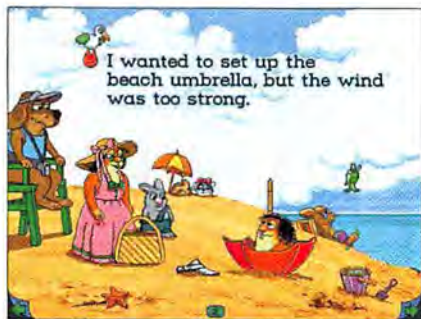
★★★★½



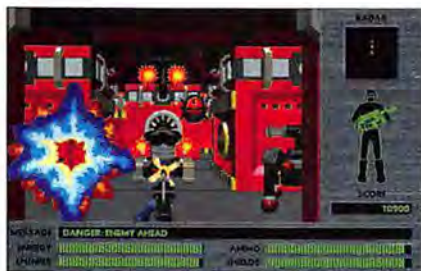
Map lovers and would-be astronauts will thrill to the wealth of



Small Blue Planet



Living Books



Lunicus

maps and satellite images in **Small Blue Planet**, an interactive electronic atlas. Navigate among a world political map (complete with statistics and historical information for each country), global and U.S. relief maps, and a gallery of breathtaking satellite images ranging from major cities to glaciers and canyons. You also get The Chronosphere, which correlates times and dates with the patterns of night and day across the globe.

### 6. Living Books

Brøderbund Software; \$59.95 each.

★★★★½



If you have kids, drop whatever you're doing, pick up your phone, and order Just Grandma and Me and Arthur's Teacher Trouble, the first two discs in Brøderbund's animated, interactive **Living Books** series. If you don't have kids, buy Grandma and Arthur anyway, if only to see just how elegant and entertaining multimedia can be. Both multilingual discs, based on popular children's books, lead you through witty, whimsical worlds where — at the

click of a mouse — starfish dance, cookies sing doo-wop, and the shy kid beats the class brain in the annual school spelling bee.

### 7. Word Tales

Time-Warner Interactive Group; \$59.99.

★★★★½



New readers (from four to seven years old) will love **Word Tales**, a collection of games featuring an animated character called Milo, who teaches children the sounds of letters and how they combine to form words. In the first part of the game, children match the correct initial letter to a word; when that's done, an animated scene appears containing several items that begin with that letter. But it's not all work — there's also an arcade game kids can play as a reward as they successfully complete each Word Tale.

### 8. Lunicus

Educorp Computer Services; \$99.

★★★★½

The king of CD-ROM adventure games is **Lunicus**. Other games may have prettier graphics and

**Dinosaur Directory**

**Velociraptor**

**MEANING OF NAME** 'quick plunderer'

**ERA** Late Cretaceous

**LOCATION** China, Mongolia, and the CIS

**FEATURES** A small carnivorous dinosaur with long hind legs and a sharp second-toe claw flicked forwards for attack. These animals may have hunted in packs.

**LENGTH** 6ft (1.8m)

**FAMILY** Dromaeosauridae

**INFRAORDER** Deinonychosauria

**SUBORDER** Theropoda

**ORDER** Saurischia

**Velociraptor** million years BC

240 140 65

10

**Dinosaurs!**



more-cohesive story lines, but Lunicus succeeds because it moves you through a 3-D environment *quickly*. Speaking with realistic "cyberpuppet" characters can give you important clues, but game players who crave an old-fashioned shoot-'em-up won't be disappointed. From gunfights with alien robots to tank battles on city streets, Lunicus delivers the ammo.

## 9. Stravinsky: The Rite of Spring

The Voyager Company; \$99.95.

★★★★½



How many classical-music premieres start riots? *The Rite of Spring* did. Years later it was still inspiring everyone from Charlie Parker to Walt Disney. Now **Stravinsky: The Rite of Spring** is a brilliant CD-ROM. Stravinsky's score is still a more subversive piece of music than anything you're likely to hear from pseudocyberpunk Billy Idol, and UCLA professor Robert Winter (see #38, Beethoven: Symphony No. 9) uses the Mac to make the piece's notoriously complex structure accessible to anyone. The performance by Charles Dutoit and the Montreal Symphony is electrifying too.

## 10. Dinosaurs!

Sony Electronic Publishing; \$79.

★★★★½



It's difficult to imagine a CD-ROM subject with more kid appeal than **Dinosaurs!** Maybe a disc that contained a complete set of X-Men trading cards? Although this might seem a little tame after seeing Spielberg's velociraptors stalk the silver screen, it contains a lot more real information about the creatures themselves. Unfortunately, the

only animated QuickTime dinosaurs on hand are elderly paleontologists.

## 11. Iron Helix

Spectrum HoloByte; \$99.95.

★★★★½

Futuristic 3-D adventure games are becoming common on CD-ROM, but **Iron Helix** isn't like the rest. Sure, it's got an engrossing plot and great graphics (with slow response times to match), but in *Iron Helix*, you control a *defenseless* robot space probe. There's no shooting in this game: If you're going to save an innocent planet from destruction, you're going to have to rely on your wits alone.

## 12. The Madness of Roland

HyperBolt Studios; \$59.95.

★★★★½



**The Madness of Roland** is based on medieval legend and it looks like an illuminated manuscript, but the strategy of this multimedia novel is purely modern. You move among five sometimes conflicting points of view, branching off into layers of witty or poetic commentary and startling QuickTime movies.

## 13. 21st Century Media PhotoDisc Series

21st Century Media; \$299; starter kit, \$69.

★★★★½

**21st Century Media PhotoDisc Series** is a seven-volume (and counting) series that steers clear of clichés while offering images ranging from people at work and play to wildlife and the environment to world commerce and tourism. Its innovative image-cataloging software makes finding files a snap.

KEY	
	Educational
	Great for kids
	Superior sound
	Features QuickTime



The Madness of Roland



21st Century Media PhotoDisc Series

## What You Need

If you haven't invested in a CD-ROM drive yet, or if one didn't come with your Mac, check out the latest MacUser Labs test results on CD-ROM drives, in "Double-Time CD-ROM Drives," October '93, page 110. Also, be aware that for the full multimedia experience, you might need to invest in more than just a (preferably fast) CD-ROM drive. Many programs don't run reliably on systems with less than 8 megabytes of RAM. And good stereo speakers (Apple sells a pair for \$179) will enhance the audio aspect of your multimedia experience considerably.



## CD-ROM Top 50



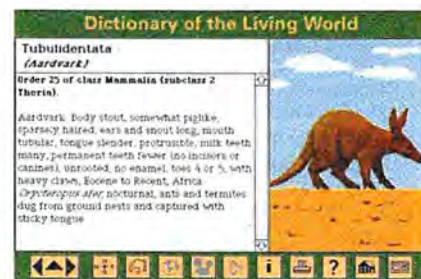
**Funny: the Movie in QuickTime**



**Musical Instruments**



**MovieSelect**



**Dictionary of the Living World**

### 14. Baseball's Greatest Hits

The Voyager Company; \$79.95.

★★★★½



If you want to hear Ty Cobb giving base-stealing advice, watch Bobby Thomson's miracle in '51, or play the most arcane baseball-trivia game ever devised, get **Baseball's Greatest Hits**. This fan pleaser captures baseball's most memorable moments in a wealth of QuickTime movies, play-by-play recordings, photographs, interviews, and period writings.

### 15. Poetry in Motion

The Voyager Company; \$29.95.

★★★★



Some poems are meant for the page and the solitary reader, but others beg to be *performed*. **Poetry in Motion** contains QuickTime movies of 24 poets (Allen Ginsberg, Ntozake Shange, and others) in performance and interviews next to the texts of their poems. The performances add a surprising extra dimension to your reading experience.

### 16. Funny: the Movie in QuickTime

Time-Warner Interactive Group;

\$39.99.

★★★★



**Funny: the Movie in QuickTime** doesn't have the greatest picture quality, but it more than makes up for that with its material: QuickTime clips of about 100 funny stories, anecdotes, and one-liners. And since Funny's interface lets you sort by categories, you can even choose to see only jokes told by people with red hair or a strange accent — no kidding.

### 17. Musical Instruments

Microsoft; \$79.95.

★★★★



**Musical Instruments** is a stylish encyclopedia of more than 200 instruments and styles of music. By clicking on the instruments, you can hear what they sound like. The engine is remarkably fast, the graphics are of good quality, and the CD-ROM offers an intuitive, easily navigable interface.

### 18. So I've Heard

The Voyager Company; \$24.95 per volume.

★★★★



If you don't know a lot about "highbrow" music, the **So I've Heard** series of CD-ROMs written by music critic Alan Rich will painlessly educate you both to the joys of the classics and to which versions of classic works you should buy when you hit the CD store.

### 19. MovieSelect

Paramount Interactive; \$59.95.

★★★★



**MovieSelect** can end frustration over what to rent at the video store. All you have to do is enter three favorite movies, and the program generates a list of recommended rentals based on your tastes. You can search by actor, director, or title.

### 20. All My Hummingbirds Have Alibis

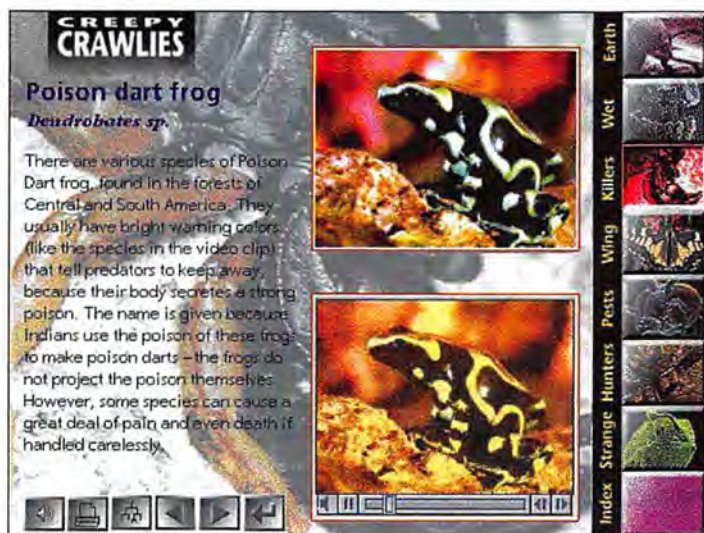
The Voyager Company; \$39.95.

★★★★



Inspired by Max Ernst's collage novels, **All My Hummingbirds Have Alibis** provides a taste of





## Creepy Crawlies

how multimedia will change and challenge artistic expression in the future. With its combination of Ernst's mystical artwork, Morton Subotnick's music, and informative commentaries, this is a fascinating disc to explore.

### 21. Mozart String Quartet

The Voyager Company; \$59.95.

★★★★



Can CD-ROMs provide an experience equivalent to chamber music? The best way to find out may be to try **Mozart String Quartet**, Voyager's treatment of one of Amadeus' most sublime works (K. 145). For serious multimedia mavens, this one is also available with an accompanying laserdisc performance.

### 22. Creepy Crawlies

Sony Electronic Publishing; \$69.

★★★★



If you like bugs, slugs, and things that live in rugs, you'll love **Creepy Crawlies**. This CD-ROM encyclopedia contains facts and QuickTime movies about more

than 70 of the strangest creatures alive. A guaranteed kid pleaser.

### 23. The Journeyman Project

Presto Studios; \$99.95.

★★★★



The **Journeyman Project** is so pretty and interesting, it's easy to forget you're playing a game. While moving through your drab life in an incredibly realistic world, you're suddenly called on to travel back in time and prevent the future from being altered. You have time to admire the attractive graphics, though — game play goes slowly.

### 24. Dictionary of the Living World

Compton's NewMedia; \$149.95.

★★★★



From *abaxial* to *zygotene* — with 2,600 stops in between — the **Dictionary of the Living World** defines, explains, and illustrates life on earth. Movies, animations, and photos combine with narration and text to explore biological

KEY	
	Educational
	Great for kids
	Superior sound
	Features QuickTime

processes, habitats, and animal life — the QuickTime movie of two adorable baby emperor penguins is alone worth the price of admission.

### 25. The Orchestra: The Instruments Revealed

Time-Warner Interactive Group; \$79.98.

★★★★



Featuring Benjamin Britten's *The Young Person's Guide to the Orchestra* (in a performance conducted by the composer), **The Orchestra: The Instruments Revealed** is a wonderful introduction to the instruments of the symphony orchestra. Audio examples, exercises, and analyses are entertainingly presented.



All My Hummingbirds Have Alibis



## CD-ROM Top 50

### 26. The Enduring Vision

D. C. Heath; \$44.95.



An interactive textbook covering American history from the 1700s to the mid-1900s, **The Enduring Vision** contains the same information you'd find in a conventional textbook but also includes sound samples from historic speeches, QuickTime movies of historical events, and extensive original source documents.

### 27. Space Shuttle

The Software Toolworks; \$49.95.



It's the ultimate in efficiency: On a single 4.75-inch CD-ROM, **Space Shuttle** squeezes a multi-billion-dollar space program, a six-month astronaut-training



**Alice: An Interactive Museum**



**Exotic Japan**



### Space Shuttle

course, and a detailed report on each shuttle flight — including dozens of QuickTime scenes depicting space walks, blastoffs, and landings.

### 28. Alice: An Interactive Museum

East West Communications; \$99.



Finding your way through the gorgeously rendered 3-D **Alice: An Interactive Museum** is a surreal, sometimes maddening adventure. Your mouse clicks animate objects and paintings (some sexually explicit, be warned), open doors, and uncork bottles of Perrier labeled "Drink Me" or "Don't Drink Me."

### 29. Cosmic Osmo and the Worlds Beyond the Mackerel

Cyan; \$59.95.



**Cosmic Osmo and the Worlds Beyond the Mackerel** transports you to some truly weird places. Climb aboard the Cosmic Osmo plane (which is equipped with the ultimate weapon: a cotton-swab shooter), and travel to planets

where dinosaur skeletons play horns and cupboards open to warp-zone hallways that take you to other planets where... well, see for yourself.

### 30. Aesop's Fables

Discis Knowledge Research; \$29.95.



Discis pioneered the CD-ROM-stories-for-kids concept, and **Aesop's Fables** is an example of why its titles are among the best. The illustrations are excellent, and each fable's accompanying music is well chosen. Kids can have the fables read to them or can read them themselves.

### 31. Hell Cab

Time-Warner Interactive Group; \$99.99.



**Hell Cab** is yet another entry in the multimedia adventure-game genre — this time you're at the mercy of a devilish cab driver who's out for more than just your fare. The ride is hip and stylish but, like the real thing, not particularly fast.



### 32. Exotic Japan

The Voyager Company; \$99.95.

⚡⚡⚡½



If you want to learn about Japanese culture, traditions, and language but can't swing the plane fare just yet, pick up a copy of **Exotic Japan**. This disc is more than just a travel guide or language program; it helps you understand Japanese society.

### 33. Think and Talk

HyperGlot Software; \$199.

⚡⚡⚡½



Each **Think and Talk** package is a seven-CD-ROM set that promises to teach you to speak and write Spanish, French, German, or Italian. Complete vocabulary lists, conjugation tables, and pronunciation are included.

### 34. Rock Rap 'n' Roll

Paramount Interactive; \$79.99.

⚡⚡⚡½



**Rock Rap 'n' Roll** turns your Mac into the ultimate beat box,

with music from rap to rock on tap. Kids especially ought to find this fun, but even adults are likely to find it at least temporarily addictive. Could earn the enmity of your neighbors, though.

### 35. Sherlock Holmes, Consulting Detective

ICOM Simulations; \$69.95 per volume.

⚡⚡⚡½

For those people who always guess the murderer before the end of the mystery novel comes the **Sherlock Holmes, Consulting Detective** series. Each of the three Sherlock discs contains three unique mysteries. To solve each case, you interview witnesses and suspects (played by actors) via digitized movies.

### 36. Rodney's Wonder Window

The Voyager Company; \$39.95.

⚡⚡⚡½



Kids under ten will love the unusual **Rodney's Wonder Window**, which contains silly QuickTime-movie antics and cartoonlike action. Kids can't make their own movies, but the

#### KEY



Educational



Great for kids



Superior sound



Features QuickTime



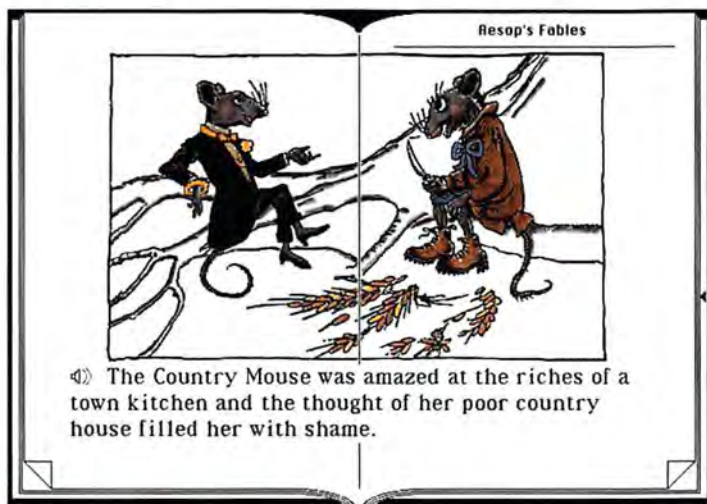
Rock Rap 'n' Roll



Sherlock Holmes, Consulting Detective



Rodney's Wonder Window



Aesop's Fables



## CD-ROM Top 50

graphics and concepts may inspire them to create their own "wonder windows," using programs such as Brøderbund's KidPix.

### 37. Schubert Trout Quintet

The Voyager Company; \$59.95.

†††½



The CD-ROM format often seems to best lend itself to program music such as the famous *Trout Quintet*. The disc *Schubert Trout Quintet* offers a fascinating analysis of the structure of the quintet as well as information about Schubert the man and the composer.

### 38. Beethoven: Symphony No. 9

The Voyager Company; \$79.95.

†††½



Beethoven: *Symphony No. 9* was the first CD-ROM Guide to the Classics, and it still holds up well,

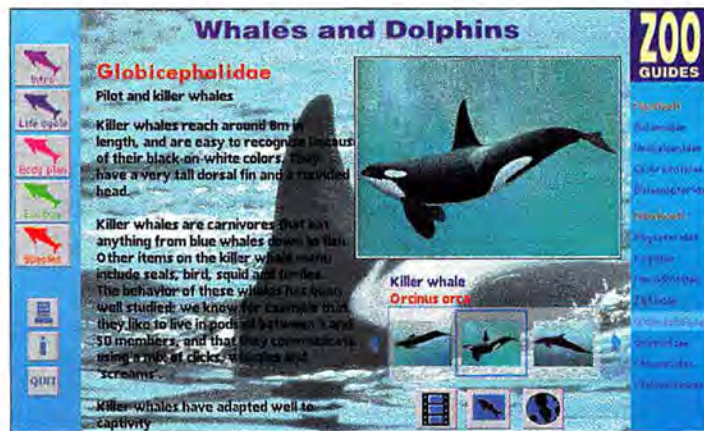


A Silly Noisy House



From Alice to Ocean

## Whales and Dolphins



largely because of the contagious enthusiasm of its author, Robert Winter. No wonder Microsoft licensed this program as a showpiece for Windows.

### 39. Strauss: Three Tone Poems

The Voyager Company; \$59.95.

†††½



Strauss: *Three Tone Poems* takes three of Richard Strauss' tone poems — *Don Juan*, *Till Eulenspiegel*, and *Death and Transfiguration* — and gives them Voyager's usual high-class(ical) treatment. It's in black-and-white only, but its beautiful art-nouveau graphics put many color programs to shame.

### 40. A Silly Noisy House

The Voyager Company; \$59.95.

†††½



*A Silly Noisy House* is an engaging CD-ROM for the under-five set that lets kids navigate through a magical house inhabited by a family of teddy bears. A click of the mouse sends household objects cavorting across the screen to the sound of familiar nursery rhymes and songs.

### 41. Spaceship Warlock

Reactor; \$95.

†††½

The first of the high-concept graphical CD-ROM adventure games, *Spaceship Warlock* still sports impressively slick graphics — but be prepared to spend a fair amount of time waiting around.

### 42. The Mayo Clinic Family Health Book — Interactive Edition

Interactive Ventures; \$99.95.

†††½



Hypochondriacs will thrive on *The Mayo Clinic Family Health Book — Interactive Edition*. It contains hundreds of illustrations, video clips, and animated segments showing medical procedures and parts of the body.

### 43. I Photograph to Remember

The Voyager Company; \$39.95.

†††½

*I Photograph to Remember* is a series of almost 100 haunting black-and-white photographs that testify to the strength of photographer Pedro Meyer's family relationships. In a choice of



English or Spanish, Meyer's spoken narrative movingly conveys his feelings toward his parents as they confront terminal illness.

#### 44. The Oregon Trail

MECC; \$69.95.

☆☆½



The Oregon Trail puts you into the shoes of a pioneer traveling from Missouri to the Willamette Valley. You have to decide what to pack, when to go, the pace of your journey, and what to do in an emergency. Each decision affects the outcome of your journey, so be careful!

#### 45. AgfaType CD-ROM 4.0

Agfa Division, Miles; \$99 (starter set).

☆☆½

Unlockable CD-ROMs have been slow to take off, but the AgfaType CD-ROM 4.0 font collection may convert skeptics. Not only does it give you instant phone access to high-quality fonts from Agfa, Adobe, and the Font Bureau but you also get an interactive type

tutorial, an extensive glossary, and 12 megabytes of graphics-related shareware.

#### 46. Whales and Dolphins

REMedia; \$59.95.

☆☆½



Whales and Dolphins is the second in a series of beautiful interactive zoo discs from REMedia (the first one was about butterflies). Simple animations and QuickTime movies supplement chapters on the creatures' life cycle, body plan, and ecology.

#### 47. From Alice to Ocean

Addison-Wesley Publishing; \$48.95.

☆☆



Fill your screen with Rick Smolan's color photos of the Australian outback as From Alice to Ocean tells the story of Robyn Davidson's camel trek across the desert. A map lets you jump to any portion of the journey, and buttons take you to historical and cultural topics. Perfect for didgeridoo fans.

KEY	
	Educational
	Great for kids
	Superior sound
	Features QuickTime

#### 48. Beauty and the Beast

New Media Schoolhouse; \$69.

☆☆



Beauty and the Beast offers an interactive version of the favorite tale, with animated illustrations and definitions of difficult words. The program can be slow at times, but the illustrations are good.

#### 49. Victor Vector & Yondo: The Vampire's Coffin

Sanctuary Woods Multimedia; \$59.95.

☆☆



Some first-rate comic-book graphics enliven Victor Vector & Yondo: The Vampire's Coffin, an interactive time-travel adventure aimed at kids (although teenagers may find it fun too). Yondo's a talking Saint Bernard. Victor's an overmuscled eager beaver. More installments of their adventures are forthcoming.

#### 50. Sightlines

DiscMore Productions; \$125.

☆☆

Sightlines is an encyclopedia of visual images that spans 4,000 years. The interface is somewhat clunky and the images are fuzzy at full size, but the sheer amount of information makes this two-CD-ROM set a valuable research tool.



## Beauty and the Beast

continues ►



### Directory

**Addison-Wesley Publishing**

One Jacob Way  
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617-944-3700

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800-424-8973  
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**Broderbund Software, Inc.**

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**Compton's NewMedia**

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**D. C. Heath and Co.**

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**Discis Knowledge Research**

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**Sanctuary Woods Multimedia Corp.**

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La Cie's Famous PocketDrive

**PocketDrive**  
**\$269**

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Size	PowerBook Internal	PocketDrive
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PocketDrives, less than 10 oz.  
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## It's a snap to use La Cie's PocketDrive.

With La Cie's PocketDrive, you can enjoy the convenience of our exclusive T-connector or PocketDock, the desktop accessories that make connecting and disconnecting your PocketDrive a snap. La Cie's PocketDrive comes with our unique

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- Built-in switchable active termination.
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- Smallest drive chassis.
- U.S. and world-wide universal AC adapters available.
- Award-winning industrial design.
- Silverlining hard disk management software with auto drive spin-down.
- Macworld "Editor's Choice" and World Class Awards.

### Theirs

- Internal termination does not meet SCSI specifications.
- Moving drives requires reconfiguration of the SCSI chain, some models must be last in SCSI chain.
- AC adapters not readily available.
- Generic design.
- Does not have Silverlining features and benefits.
- No awards.

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MacWeek, May 1993

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**170MB**  
**\$199** **HOT!**



Quantum 3.5" Drives

**MACWORLD**  
**EDITORS' CHOICE**

As low as  
**\$269**



La Cie's Famous PocketDrive

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**128MB Optical**  
**\$949**

It's hard to beat the safety record of optical drives. La Cie's Cirrus optical uses cartridges the same size as 3.5" floppies, but store almost 160 times more. They deliver speed and reliability in our award-winning Cirrus chassis. And that's not all; each drive includes award-winning Silverlining (\$149 free value, Bobker's Dozen) and one free cartridge (\$45 value).

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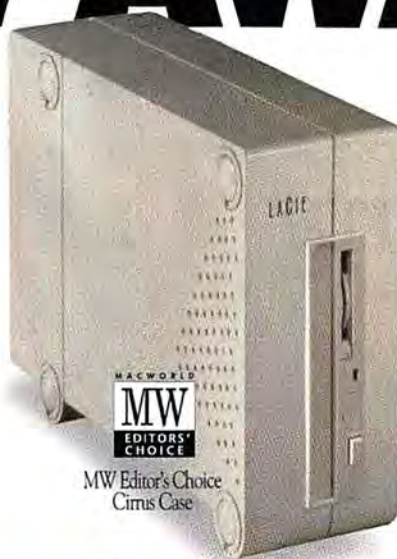


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## 105MB SyQuest Drives

Size	Internal	External
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105MB Cartridge		<b>\$79</b>

ZFP's from  
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Size	Internal	External
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44MB Cartridge		<b>\$69</b>
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# Choosing the Right REMOVABLE



**SyQuest:** *up  
to 105 MB per  
cartridge*

If optical, Floptical, SyQuest, and Bernoulli sound more like storybook characters than storage technologies, we can help.

BY JOHN RIZZO

Removable storage can be such a pain. It's tough enough making heads or tails out of all the vendors' claims when you buy a hard drive, but trying to make sense of magnetic, magneto-optical, and Floptical technologies can make buying a removable-storage device downright scary.

To make the buying process less of an ordeal and to ensure that you end up with the





**Optical:** *up to  
1.3 GB per cartridge*

**Floptical:**  
*up to 21 MB per  
cartridge*



**Bernoulli:**  
*up to 150 MB  
per cartridge*



best storage device possible, you've got to know why you're buying it. If you're considering removable storage, chances are you need portability, expandable capacity, security, or some combination of these three.

It also helps to know what the various removable technologies are. For starters, there are drives that store data on cartridges that contain magnetic disks like those in most hard

drives. The most popular magnetic-removable-cartridge devices for Macs are probably those that are based on mechanisms made by SyQuest. They use two types of 5.25-inch cartridges — ones that can hold 44 megabytes and others that can hold 88 megabytes (the 88c mechanism can also read and write 44-megabyte cartridges) — and a new 3.5-inch, 105-megabyte cartridge.



## Removable-Storage Systems

Iomega makes a family of magnetic-cartridge drives called Bernoulli drives, which use 5.25-inch cartridges that come in 90-megabyte and 150-megabyte varieties. You can also get 105, 65, and 35 cartridges that can be used in the MultiDisk 150 drive.

Also available are various removable-hard-drive systems that consist of a docking station for modules containing hard-drive mechanisms.

Magneto-optical-cartridge drives, commonly known as optical drives, come in a variety of types too. The larger drives store data on 5.25-inch cartridges that can hold 650 megabytes, 1 gigabyte, or 1.3 gigabytes. Smaller drives use 3.5-inch cartridges that can store 128, 230, or 256 megabytes each.

Finally, we have Floptical drives. These megafloppy drives use magnetic technology to store data and optical technology to locate it. A Floptical cartridge, which looks like a floppy disk, stores 21 megabytes.

Confused yet? See the "Reading, 'Riting, and Removability: How the Technologies Differ" sidebar for a quick rundown on the major removable-storage technologies. Remember, at least ten companies sell drives based on each of these technologies (see Table 2). Whatever your reason for buying a removable-media drive, cost is a major consideration.

### What Will You Pay?

Suppose you need 650 megabytes of storage. That would take one 5.25-inch magneto-optical cartridge

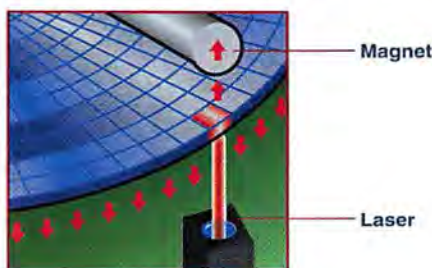
costing \$90; or three 3.5-inch, 256-megabyte cartridges costing \$150; or five 3.5-inch, 128-megabyte cartridges costing \$225. On the magnetic side, it would take six 105-megabyte SyQuest cartridges costing \$450; or eight 88-megabyte SyQuest cartridges costing \$800; or fifteen 44-megabyte cartridges costing \$950; or thirty-one Floptical cartridges costing \$715.

Looking at these costs, you might ask why anyone would buy a SyQuest, Bernoulli, or Floptical drive. Well, there are two reasons. First, although optical *cartridges* are cheaper, optical *drives* cost a lot more than SyQuest or Bernoulli drives — it's the old, "Do I buy the expensive razor with the cheap blades or the cheap razor with the expensive

## Reading, 'Riting, and Removability: How the Technologies Differ

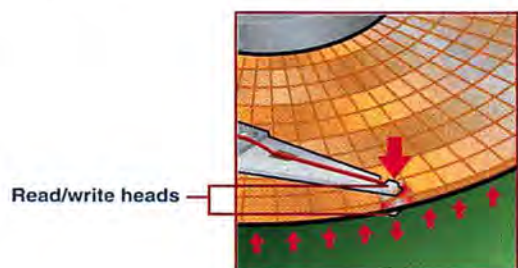
### Magneto-Optical

Magneto-optical drives use a laser beam to write data to and read it from a plastic disc. During a write or erase pass, the laser heats a spot on the disc to about 302 degrees Fahrenheit. The heated material retains the magnetic polarity of a magnet on the opposite side of the disc. During the erase pass, the magnet changes the entire sector to a uniform polarity. During the write pass, the magnet switches polarity to record data.



### SyQuest

A SyQuest drive is, in essence, a hard drive that has a removable disk. A hard-plastic cartridge contains a highly polished aluminum disk plated with a magnetically sensitive metal alloy. When the cartridge is inserted into a drive, the disk's metal hub is held and rotated by a magnetized spindle. The magnetic read/write heads move close to the disk's surface while reading data from or writing data to the disk.





blades?" The second reason is that you might never need as much as 650 megabytes of storage. For example, you might just use two cartridges that you swap with a service bureau and might never exceed 88 megabytes per transaction.

To get a handle on which technology is right for you, let's take a closer look at why you need a removable-storage device in the first place.

### Take It Away

The need for portability is probably the single biggest reason for buying a removable-storage device. Swapping data with colleagues or sending documents to service bureaus for printing requires reliable, capacious storage. The first thing to look for if you plan to ship your data

anywhere is a device that uses rugged, inexpensive cartridges. It doesn't matter how fast a drive is if the cartridges it uses are dead on arrival when you send them away. It's also a serious problem if each cartridge costs a day's salary. Finally, you need to be sure there's a compatible drive at the destination.

Optical storage technology is the most rugged, because the medium is impervious to magnetic fields. We examined the ruggedness of various sample cartridges by conducting controlled drops onto different surfaces and by mailing them across the country and back. In these tests, all the cartridges survived except for the 105-megabyte SyQuest ones.

Be aware that simply opening the aperture of a magnetic cartridge and

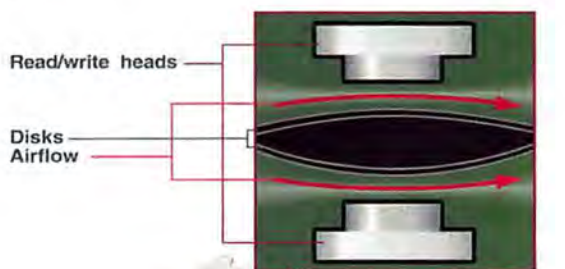
placing a greasy finger on the medium or breathing on it can be enough to render the cartridge and its data useless. In the case of an optical cartridge, you can remove fingerprints by wiping the disc with a clean cloth in a straight line from the hub to the outer edge.

We also subjected the cartridges to extremes of temperature and humidity. Only the Bernoulli cartridges failed, becoming unusable after an hour at 185 degrees Fahrenheit and 45-percent humidity.

As for compatibility, just about every service bureau has a SyQuest drive of some kind, but many are adding optical drives at their customers' request. Before you buy, check with your local bureau to see what it's using.

### Bernoulli

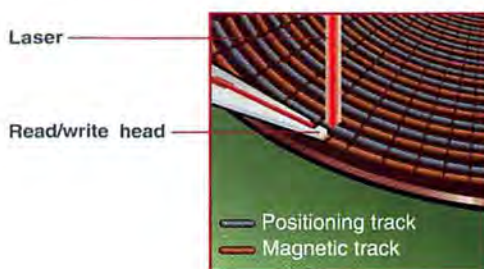
An Iomega Bernoulli drive uses a cartridge that contains two flexible plastic disks coated with a magnetically sensitive metal alloy. As the disks spin, air moves outward over them, passing between the disk surface and the drive's read/write heads. The reduced air pressure causes the disks to come almost into contact with the heads. This process is called the Bernoulli effect.



### Floptical

A Floptical drive — as its name suggests — uses a hybrid of magnetic-floppy-disk and optical technologies. A Floptical cartridge contains a disk that has concentric positioning tracks through which the light of a laser can pass. The laser light is used to position the read/write heads over the concentric magnetic tracks.

— John Rizzo





## Removable-Storage Systems

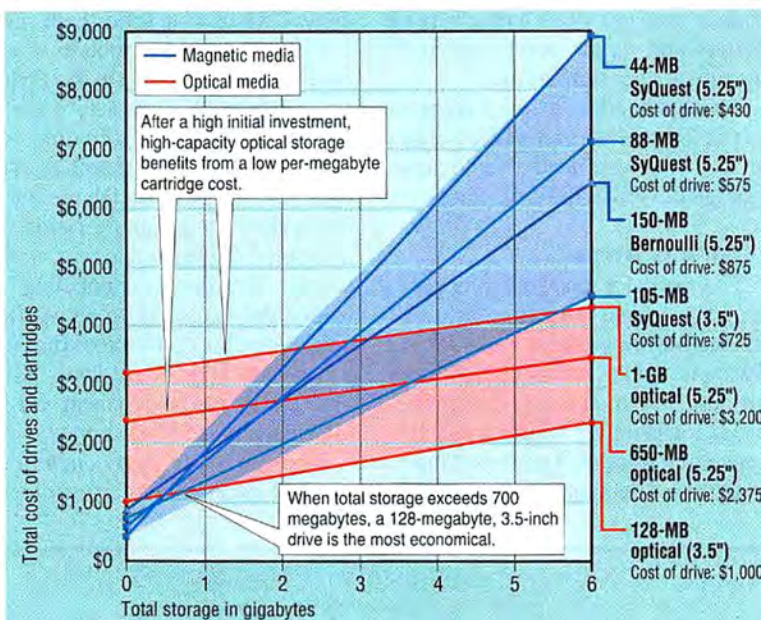
### I Need My Space

From time to time, we've all wished our hard disk would never fill up, but it usually does. To get around this, the obvious answer is to move older, less frequently used data off your hard disk. But where can you put it? If you need a place to put files you can't accommodate on your hard disk, a removable-storage system can really help you out.

Your first considerations should be: How long you expect to need the data you're archiving, how big the files are, and how much data you expect to move from your hard disk in the future. Notice we didn't mention drive speed. If all you need is more storage space to free up room on your hard disk, the speed of a storage device should not top your list of considerations. In fact, speed is seldom the best reason for buying a removable-storage device. A hard drive is almost always faster than a removable-storage device, so you



### Figure 1: Economies of Scale



## Table 1: Pros and Cons of Removable-Storage Systems

Technology	Pros	Cons	Ideal Users
Bernoulli	<ul style="list-style-type: none"> <li>Moderately fast drives.</li> </ul>	<ul style="list-style-type: none"> <li>Cartridges vulnerable to magnetic fields.</li> <li>Cartridges vulnerable to dust.</li> </ul>	<ul style="list-style-type: none"> <li>This is a handy solution for users who need to perform short-term personal backups.</li> </ul>
Floptical	<ul style="list-style-type: none"> <li>Inexpensive drives.</li> </ul>	<ul style="list-style-type: none"> <li>Limited range of cartridge capacities.</li> <li>Slow drives.</li> <li>Cartridges vulnerable to magnetic fields.</li> </ul>	
Magneto-optical	<ul style="list-style-type: none"> <li>Inexpensive cartridges.</li> <li>Rugged cartridges.</li> <li>Large range of cartridge capacities.</li> <li>Cartridges impervious to magnetic fields.</li> </ul>	<ul style="list-style-type: none"> <li>Expensive drives.</li> <li>Drives slower than magnetic equivalents.</li> </ul>	<ul style="list-style-type: none"> <li>This is the most versatile and cost-effective solution for users who need to transport, archive, or back up large amounts of data.</li> </ul>
Removable hard drive	<ul style="list-style-type: none"> <li>Fast drives.</li> <li>Large range of cartridge capacities.</li> </ul>	<ul style="list-style-type: none"> <li>Expensive drives.</li> <li>Bulky and heavy drives.</li> <li>Mechanisms vulnerable to magnetic fields.</li> </ul>	<ul style="list-style-type: none"> <li>Users who must secure their data but don't need to take it far from their Macs will find this technology worth the investment.</li> </ul>
SyQuest	<ul style="list-style-type: none"> <li>Widely used.</li> <li>Fast drives.</li> <li>Moderate cost per megabyte.</li> <li>Inexpensive drives.</li> </ul>	<ul style="list-style-type: none"> <li>Cartridges vulnerable to dust, impact, and magnetic fields.</li> <li>Expensive cartridges.</li> </ul>	<ul style="list-style-type: none"> <li>Users who must secure their data but don't need to send cartridges over long distances will find this technology worth the investment.</li> </ul>



Figure 1: When choosing a removable-cartridge drive, first estimate the total amount of storage space you plan to fill over the life of the drive. If you need only a few hundred megabytes of space, a low-cost magnetic drive based on SyQuest or Bernoulli technology may be your best bet. If your needs are greater, however, choose an optical drive. Even a high-end optical drive that uses 5.25-inch cartridges can save you money in the multimegabyte range. (Our cost projections are based on average drive and cartridge prices during July 1993; your mileage may differ, of course.)

should work with your hard drive whenever possible.

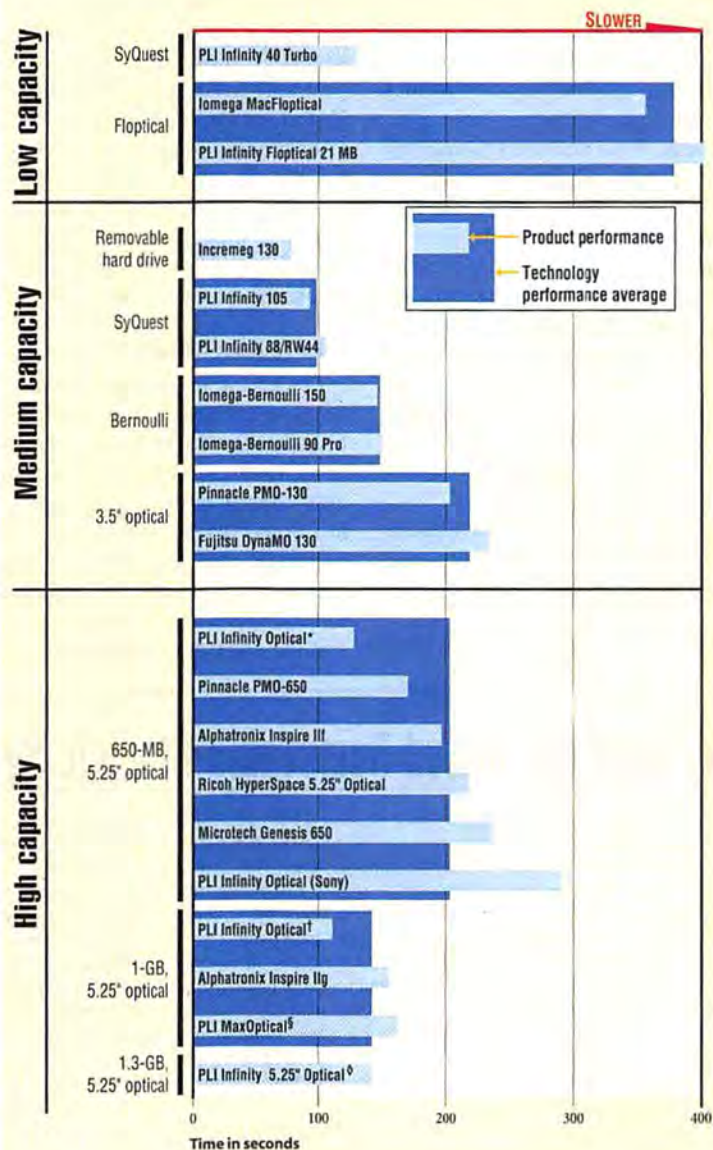
When you archive data, you will be using either the Finder or a utility such as DiskTop to move old data between your Macintosh's hard disk and a removable-storage medium. You probably will not have to do this often — a few times each day at most. What is really important is that the archive medium has a long life span so your data is safe, in case you need to archive data for a long time.

Generally, optical cartridges offer the greatest longevity and data security. Magnetic media such as SyQuest, Bernoulli, or Floptical cartridges or hard drives are vulnerable to magnetic fields: A strong magnet placed near a magnetic medium can be enough to wipe it clean.

Remember, if you plan to store gigabytes of data, work out the cost of the cartridges you'll need. And if you intend to archive huge files, the drives that use lower-capacity media are obviously out of the question.



## Figure 2: Times and Technology



\* (Tahiti III, 650 MB) † (Tahiti III, 1 GB) ‡ (Tahiti II, 1 GB) § (Tahiti III, 1.3 GB)

Figure 2: We combined the results of two tests to arrive at an overall speed rating. First, we used DiskFit Pro to back up an 18-megabyte file from the Quantum LPS 80 internal drive mechanism to each removable-storage medium. Then, using the Finder, we copied an 18-megabyte file from the internal disk to each removable-storage medium.



## Removable-Storage Systems

See Figure 1 for a cost-per-megabyte comparison of various drives and cartridges.

### Is It Safe?

Of course, everyone *wants* data security, but some people *need* data security, because it's part of their job. If your company works on sensitive government contracts, for instance, you may be required to lock up your data whenever you leave your desk. If so, you need thoroughly reliable removable storage, because what you store isn't just some files you want to trade with colleagues — it's everything, even your startup volume. If the removable-storage drive you're considering must be your startup drive too, drive speed is a critical consideration. Although you can start up your Mac with a drive based on any of the removable-storage technologies, things will go much faster if you use a hard drive.

We ran some speed tests on drives that use the various removable-storage technologies and found that the removable hard drive was the fastest; the drive based on the SyQuest 105

mechanism was a close second. The fastest optical drive we tested was based on the new MaxOptix Tahiti III mechanism in its 1-gigabyte mode.

If security is your primary concern, you probably won't care about cartridge cost or ruggedness, because the farthest your cartridges will travel is from your desk to a vault every night. A removable hard drive is probably your best bet in this case. But if expandability also fits into your buying equation, a drive based on the SyQuest 105 mechanism would be an even better choice: The cost per megabyte of a removable hard drive is much higher than that of one based on the SyQuest 105.

### Is It Mac-like?

Once you've got a good handle on what your needs really are, it's time to make sure the technologies you're considering are Mac-like. A removable-storage device should work like a floppy drive: When you put a cartridge into the drive, it should mount automatically; when you drag its icon to the Trash, the drive should spit the cartridge out. Simple, right?

Unfortunately, it's never quite that simple.

To eject a SyQuest cartridge, for instance, you must first press a button on the drive; the disk spins down, and you then push a lever to eject the cartridge. With 5.25-inch-cartridge drives, it is possible to push the eject lever while the disk is still spinning down, which can damage both the drive and the cartridge. This is not a problem with the 3.5-inch-cartridge SyQuest mechanism.

To eject a Bernoulli cartridge, you drag its icon to the Trash, wait for a light to stop flickering, and then pull out the cartridge.

Removable hard drives differ in behavior. Most hard-drive volumes mount automatically like a floppy disk, and the La Cie ExpressDrive removable hard drive ejects mechanisms like a floppy drive ejects floppy disks. But you dismount some removable hard drives, such as the MountainGate Incremeg and Mega Drive Mercury, by pulling the mechanisms out of the docking station. This method can be a real problem: It's possible to remove a mechanism before it has



## How We Tested Removable-Storage Systems

To test removable-storage drives, we used a Mac IIci with 8 megabytes of RAM, a Quantum LPS 80 hard-drive mechanism, a cache card, and a 13-inch AppleColor High-Resolution RGB Monitor driven by on-board 8-bit video. Each test machine had System 7.1 installed. Virtual memory, menu blinking, and AppleTalk were turned off; 32-bit addressing was turned on; the disk cache was set to 32K; and the video was set to 256 colors. We formatted the media for each removable-storage drive by using the software shipped with it.

To compare overall speed, we performed two tests: an 18-megabyte file backup, using DiskFit Pro 1.2, and a Finder drag-copy of an 18-megabyte test file from the Mac's internal hard disk to the test drive's storage medium.

We ran each test six times — three times with the write/verify feature enabled and three times with it disabled. We analyzed the scores and averaged the results. (All the drives were measurably slower with the write/verify feature enabled.)

We also put each drive through usability tests, to look for foolproofing features for situations such as trying to eject a cartridge during a write. In addition, we checked each drive's file-sharing abilities and sound level. We measured sound in our new anechoic chamber, using an Audio Precision Audio Signal Analyzer. To get the sound level, we subtracted all

ambient noise except that emitted by the Mac IIci to which the drive was attached.

Although it wasn't possible to test cartridge shelf life (who has 15 years?), we did run some durability tests. We used Bernoulli cartridges from Iomega, SyQuest cartridges from SyQuest, Floptical cartridges from 3M, magneto-optical cartridges from Verbatim, and Tahiti magneto-optical cartridges from MaxOptix. Each cartridge contained a 14-megabyte Adobe Photoshop file. After each test, we checked the file to see if it was still usable.

First, we conducted heat and humidity tests. We stored the cartridges in a humidity-controlled environmental chamber at 45-percent humidity for an hour at 150 degrees Fahrenheit and again at 185 degrees. Then we subjected the cartridges to an hour at 73 degrees Fahrenheit and 95-percent humidity. We also stored them at freezing temperatures for an hour.

To see how well the cartridges traveled, we packed each one in the protective covering it shipped with and placed it inside a box with packing material. We mailed the boxes to our New York office, and our colleagues mailed them back to us in California. Again, we examined the data on all the cartridges to see if it had survived the trip.

— Fred DeLisio and Kristina DeNike



had a chance to spin down.

Optical and Floptical drives act just like floppy drives: You drag a cartridge's icon to the Trash, and the drive spits out the cartridge.

Let's suppose you've decided you need the ruggedness and capacity of a 1.3-gigabyte optical cartridge or perhaps capacity of a 105-megabyte SyQuest cartridge and the speed of its drive. What if you just can't afford the cost of the appropriate system? Don't give up hope — driver-level compressors such as Stacker for Macintosh, from Stac Electronics, or TimesTwo, from Golden Triangle, can significantly bump up the capacity of optical and SyQuest cartridges.

## Trends

Since the first reels of magnetic tape were strapped to mainframes 40 years ago, computer storage has continued to get bigger, faster, and cheaper while coming in smaller packages. We'll see the same pattern with removable storage for your Mac in the next few years.

- **SyQuest will exploit hard-drive innovations.** To see where SyQuest is going, you have only to look at where hard drives are now. Soon, 3.5-inch and 5.25-inch SyQuest cartridges will be able to hold even more data — 3.5-inch cartridges will more than double in capacity to well over 210 megabytes. Increased capacity will also improve data-transfer rates, because data on a disk will be more densely packed.

- **SyQuest will make postage-stamp-sized cartridges.** SyQuest is in the process of developing a 1.8-inch-cartridge mechanism based on PCMCIA, the tiny port standard now used in PC laptops and Apple's Newton MessagePad. Unlike with other PCMCIA drives, the removable portion of the SyQuest version will be the disk only, not the heads, so cartridges should be less expensive than those for other PCMCIA drives.

- **A standards war is coming for 3.5-inch optical drives.** During the next few months, two competing standards for increased-capacity 3.5-inch optical cartridges will emerge — 230-megabyte and 256-megabyte. The drives that use the new cartridges will still be able to read from and write to current cartridges. The denser media will also bring

For instance, 256-megabyte, 3.5-inch optical cartridges are not as widely available as the 128-megabyte variety, so swapping these cartridges with others can be a problem. If you use one of these compression products with a standard 128-megabyte cartridge, though, you'll get greater storage capacity — and the cartridge should work with any other 128-megabyte optical drive.

### The Bottom Line

As you can see, when it comes to removable storage, no one technology fits all. Being aware of why you need removable storage and knowing the capacity you expect to need

drive-speed enhancements, as will improved caching, as in the new Sony SMO-E301F mechanism.

- **5.25-inch optical cartridges will hold more data.** The 1.3-gigabyte capacity will become the high-end standard as more vendors move to the MaxOptix Tahiti III and the new Sony EDM-1300 mechanisms. These mechanisms are compatible with each other and with other 1.3-gigabyte mechanisms that will come to market during the next few months. A 2.6-gigabyte cartridge is also in the works.

- **Sony will introduce a small, inexpensive, removable-storage device in late 1994.** MD Data, based on Sony's consumer-audio Mini Disk technology, will employ a 2.5-inch, 140-megabyte cartridge similar to the Floptical and will be slower than today's magneto-optical-storage devices. An MD Data drive can accept read-only, rewritable, and partially rewritable media, the latter of which contains prerecorded sections that can't be erased.

- **Blue-light specials will appear in 1995.** The light emitted from blue lasers consists of much shorter wavelengths than those of today's red lasers. The use of blue lasers in magneto-optical drives will result in narrower tracks and denser data on each track of a disc, thereby increasing the capacity of magneto-optical cartridges by three to five times that of today's. Expect to see blue lasers used in magneto-optical drives in less than two years.

— John Rizzo

over the next year or two will help you immensely if you're trying to make a buying decision. And don't let anyone force the fastest drive down your throat — for most purposes, speed should be way down on your list of priorities.

If portability is what you seek, you need a technology that offers cheap and robust cartridges: magneto-optical technology. If you don't expect to consume more than a gigabyte or two, a 3.5-inch optical drive will probably be just fine. If you think you'll go over 2 gigabytes, look for a 5.25-inch drive.

If you need expandable capacity, focus your attention on those technologies that offer rugged media and a capacity that matches your expected needs. Again, optical devices seem to have the edge over magnetic-based ones in terms of durability. But if you plan to store your cartridges in a controlled and secure place, magnetic-based devices such as SyQuest, Bernoulli, and Floptical drives will do just fine. If you expect to accumulate more than 2 gigabytes of data for storage over the next couple of years, 5.25-inch optical drives are your best bet.

Finally, if you need a removable-storage device because you must lock up your data at night, you need one that's as fast as possible, because you'll be using it just like a hard drive. For this situation, a removable hard drive is your best choice, although an expensive one — you might want to check out the cost of a standard external hard drive that you can lock up at the end of the day. Standard external hard drives are almost always cheaper than the removable variety. If security is a concern and you also want to swap data with colleagues, drives based on the MaxOptix Tahiti III or the SyQuest 105 are your next-best bet.

*MacUser* technical editor John Rizzo is the author of *How Macs Work* and *MacUser Guide to Connectivity*, both published by Ziff-Davis Press. Fred DeLisio and Kristina DeNike managed the ZD Labs testing for this report.

continues ►



## Removable-Storage Systems

**Table 2: Who Sells What**

Vendor Phone number	Drives based on these mechanisms								Removable hard drive
	SyQuest 44	SyQuest 88	SyQuest 88c	SyQuest 105	Bernoulli	Magneto- optical (3.5" cartridge)	Magneto- optical (5.25" cartridge)	Floptical	
Alphatronix 800-849-6211 919-544-0001	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
APS Technologies 800-235-3707 816-483-1600	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
ATS (AnthemTechnology Systems) 800-793-8689 408-441-7177	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
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ClubMac 800-258-2622 714-768-8130	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
CMS Enhancements 714-222-6000	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computer Upgrade 800-874-8807 909-278-5626	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contemporary Cybernetics Group 804-873-9000	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Control International 800-959-6784 404-729-1844	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Cranel 800-288-3475 614-431-8000	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
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DirectTech 800-279-5520 612-941-2616	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Dynatek Automation Systems 416-636-5000	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>



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## Removable-Storage Systems

**Table 2: Who Sells What, continued**

● = yes  
○ = no

Vendor Phone number	Drives based on these mechanisms								Removable hard drive
	SyQuest 44	SyQuest 88	SyQuest 88c	SyQuest 105	Bernoulli	Magneto- optical (3.5" cartridge)	Magneto- optical (5.25" cartridge)	Floptical	
Envisio 612-628-6288	○	○	○	●	○	●	○	○	○
ETC Peripherals 800-876-4382 813-884-2863	●	●	●	●	○	●	●	○	●
Focus Enhancements 800-538-8865 617-938-8088	●	●	●	●	○	●	●	○	○
Fujitsu 800-626-4686 408-432-6333	○	○	○	○	○	●	○	○	○
FWB 415-474-8055	●	●	●	●	○	●	●	○	○
Hardware That Fits 800-364-8737 409-760-2400	●	○	●	●	○	●	●	○	○
HDI (Hard Drives International) 800-927-7848 602-902-1176	○	●	●	○	●	●	○	●	○
Introl 612-788-9391	○	○	○	○	○	○	●	○	○
Iomega 800-777-6179 801-778-1000	○	○	○	○	●	○	●	●	○
Kintronics 800-431-1658 914-347-2530	○	○	○	○	○	●	●	○	○
La Cie 800-999-0143 503-520-9000	●	○	●	●	○	●	○	●	●
Liberty Systems 408-983-1127	●	○	●	●	●	●	●	○	○
Literal 719-579-0460	○	○	○	○	○	○	●	○	○
Mac & PC USA 800-392-5820 714-572-5350	●	●	●	●	○	●	●	●	○
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Resident PostScript Fonts	<b>17</b>	35	35	13
Simultaneously Active Ports	<b>YES</b>	No	Yes	No
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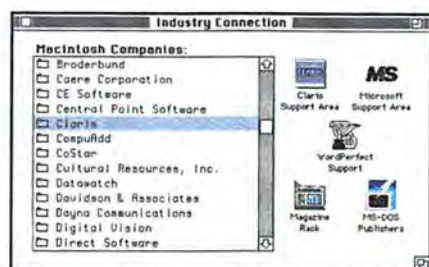
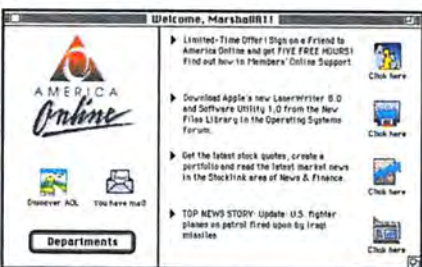
## Removable-Storage Systems

**Table 2: Who Sells What, continued**

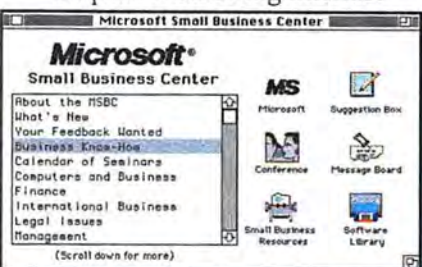
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MacWarehouse 800-255-6227 908-370-4779	●	●	●	●	●	●	○	○	○
Mac Zone 800-248-0800 206-883-1975	○	○	●	●	○	●	○	○	○
Mass Microsystems 800-522-7979 408-522-1200	●	●	●	●	○	●	●	●	○
Mega Drive Systems 800-322-4744 310-247-0006	○	○	○	○	○	○	○	○	●
MegaHaus 800-786-1173 713-333-1971	●	●	●	●	○	●	●	●	○
Memory Direct 800-486-2447 714-486-2447	●	●	●	○	○	○	○	○	●
Micropolis 818-709-3300	○	○	○	○	○	○	○	○	●
Microtech International 800-626-4276 203-468-6223	○	○	○	○	○	●	●	○	○
Mirror 800-654-5294 612-633-4450	●	●	●	●	○	●	●	○	○
MountainGate Data Systems 800-556-0222 702-786-4100	○	○	○	○	○	○	○	○	●
OAI (Optical Access International) 800-433-5133 617-937-3910	●	●	●	●	○	●	●	●	○
Ocean Microsystems 800-944-6232 714-891-8484	○	○	○	○	○	●	●	○	○
Optima Technology 714-476-0515	●	●	●	○	○	●	●	○	○



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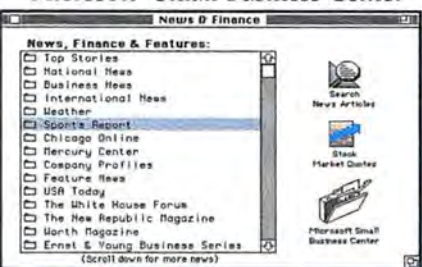
## Expert Computing Advice



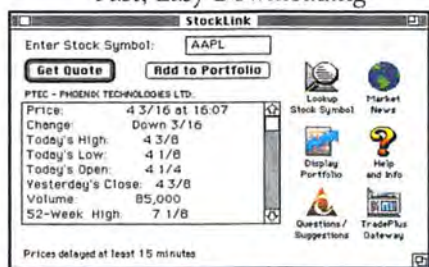
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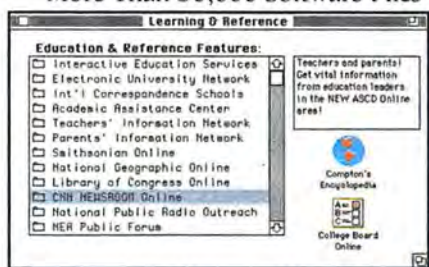
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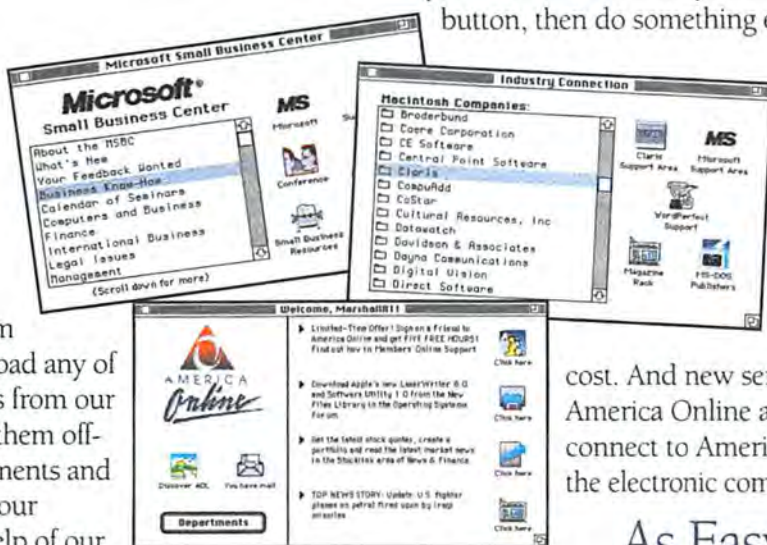
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Pinnacle Micro 800-553-7070 714-727-3300	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
PLI (Peripheral Land, Inc.) 800-288-8755 510-657-2211	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Procom Technology 800-800-8600 714-852-1000	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Relax Technology 510-471-6112	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Ricoh 800-955-3453 408-432-8800	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
River Computer 800-998-0090 802-496-7650	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Second Wave 512-343-9661	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Sony 800-352-7669 201-368-9272	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Spin Peripherals 800-466-1200 617-965-9882	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Storage Dimensions 408-954-0710	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
Teac America 213-726-0303	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ten X Technology 800-922-9050 512-346-8360	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
TMS Peripherals 800-275-4867 407-998-9928	<input checked="" type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>
Total Peripherals 508-393-1777	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tulin Technology 408-432-9057	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
XYXIS 612-378-2577	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>



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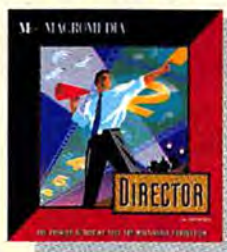


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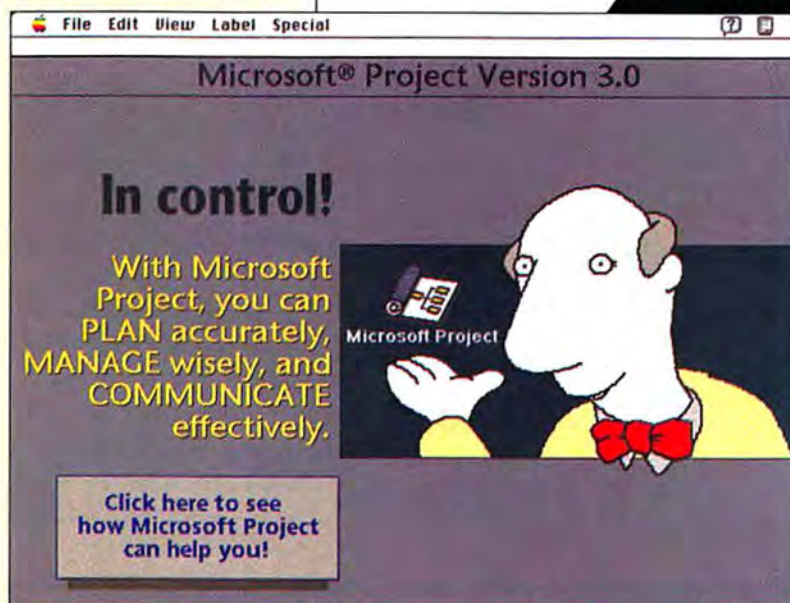
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# Do-It-Yourself *Databases*

*Building a custom database doesn't have to mean hiring a programmer — not with one of these five database programs.*

BY JAN SMITH

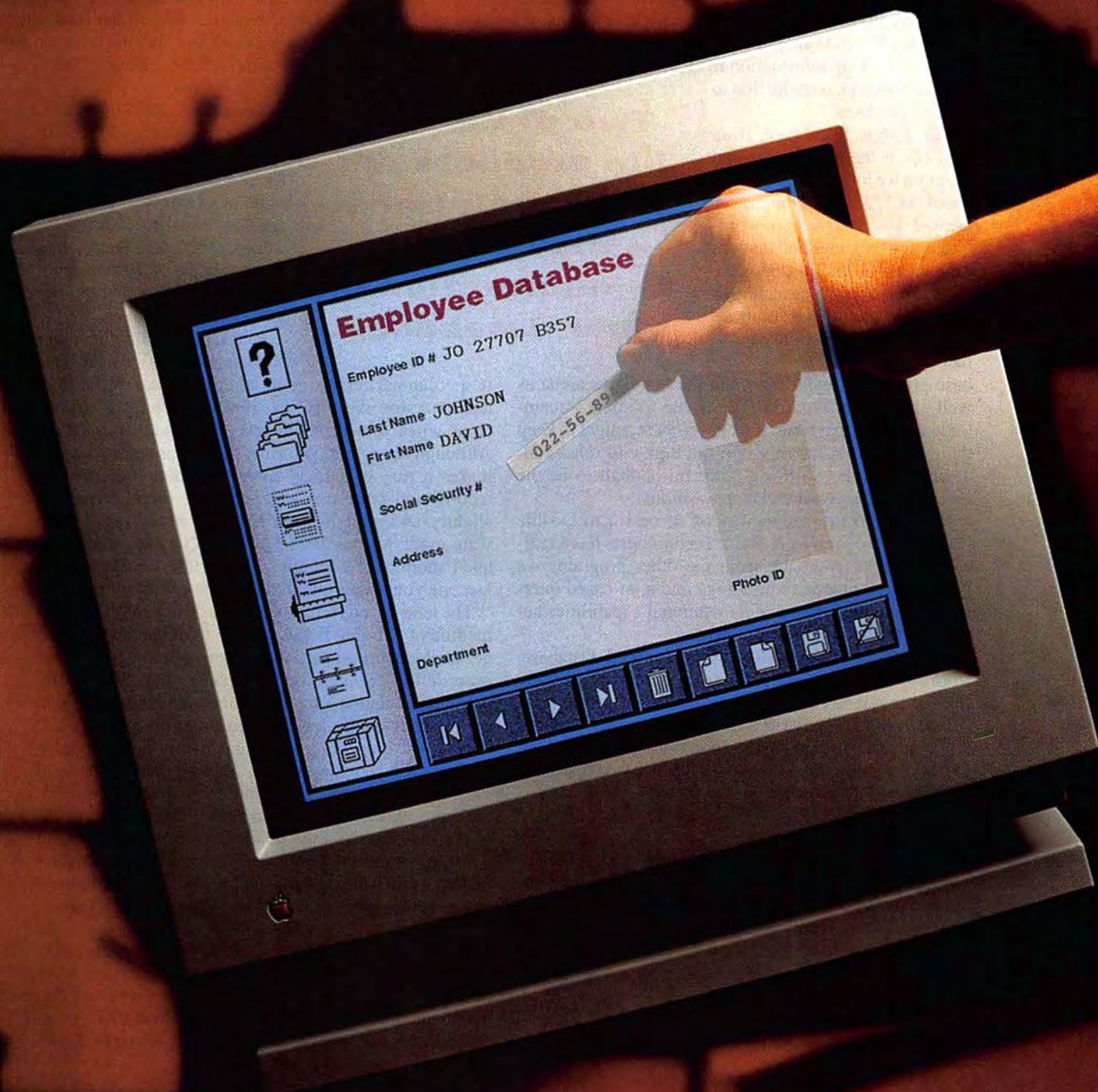
**T**he most often used database program on the Mac, some say, is actually a spreadsheet program — Excel. Never mind that it isn't designed to let you easily move fields around, perform complex searches and sorts, and build custom reports and data-entry forms. It's familiar, and using it is easier than trying to create a custom database in some expensive, bound-to-be-complicated database program, right?

Not anymore. Today, even low-cost database programs offer powerful data-handling features in easy-to-use formats. The makers of these programs claim that even novices can create an attractive, functioning database within hours, without programming.

To find out how much database power can be packed into a product that nonprogrammers can set up and use, we reviewed five database programs targeted at such users. Unlike high-end products such as ACI US' 4th Dimension and Blyth Software's Omnis Seven, these programs don't include sophisticated features such as extensive programming languages, code compilers, and run-time modules for distributing finished applications. Instead, they are devised to make designing a database system as easy as selecting items from a menu.

There's a price difference too. High-end packages can cost upwards of \$800. Four of the programs we tested — File Force, FileMaker Pro, Helix Express, and Panorama II — are priced at half that. And My Advanced Database lists at just \$59.95.







## Database Programs

### The Contenders

Because we chose products based on target audience rather than on whether the databases were flat-file or relational, we ended up with two relational- and three flat-file-database programs. *Flat-file* traditionally means each database holds one category of data — such as People or Companies — and can't be linked to other databases, as opposed to the *relational* approach of linking many single-category data files to form a database. However, two of the flat-file products we looked at, FileMaker Pro and Panorama II, have the pseudorelational ability to look up information in other databases.

Here's a quick introduction to the five products:

**File Force.** File Force, from ACI US, is the most substantial program we looked at. It's a subset of ACI US' 4th Dimension, created by removing the programming language and the runtime modules, and it retains the look and feel of its ancestor (as well as 4D's relational abilities).

**FileMaker Pro.** Long dominant among Mac flat-file-database programs (and a player in the Windows arena as well), FileMaker Pro, from Claris, has a simple, streamlined interface that reflects its developers' intent to keep the product from moving into the high-end relational-database market. Still, it's powerful enough to be the basis of simple commercial applications.

**Helix Express.** A lower-priced successor to Double Helix, this program from Helix Technologies has a radically different approach from the other programs we looked at. Its unique terminology and icon-based interface are intended to make its relational capabilities accessible to a wide range of users.

**My Advanced Database.** My Advanced Database, from My Software Company, is inexpensive and flatly flat-file, but it has a surprisingly extensive feature set.

**Panorama II.** ProVUE's Panorama II is designed for efficiency rather than good looks. It uses a table layout to get you going quickly, and its RAM-based approach is designed for fast searches and sorts.

### The Tests

To put these programs through their paces, we invented a small consulting firm called Sullivan Engineering and built and used three simple databases — employee, customer, and invoice — for it. We evaluated how easy it was to do these basic tasks in each program:

- Define data fields.
- Define database relationships.
- Create entry forms and reports.
- Access and maintain data.

In addition to evaluating ease of use, we looked at a sampling of performance issues, such as sort speed and file size.

### Field Trials

The first task in setting up any database is defining the fields you want it to contain — for example, our employee database contained fields for employee ID, first and last name, hire date, birth date, and so on. You also need to define what type of data goes in each field (such as text, numeric, date, or picture) and specify whether you want the database to automatically calculate, supply, or format the values.

#### Same Goal, Different Path.

File Force, FileMaker Pro, and My Advanced Database all offer similar and easy-to-understand ways to set up fields: You type in a sequence of field names, specifying each field's properties by selecting from options in menus or field-description dialog boxes.

Panorama II, on the other hand, opens each new database

in a columnar format, with letters in place of the field names across the top; you replace each letter with a name when you define the rest of the field's properties. Although the columnar format offers a preset layout that makes it easy to quickly enter some data (one row per record) and print simple reports, we found using it a slightly awkward method for field definition. If you want more than ten fields, you need to add columns — and Panorama II's default is to insert the field before the last one you added rather than at the end.

The icon-based Helix Express has a radically different method of defining fields, one we found unintuitive. To get to the appropriate window for defining fields, you must define a *relation* (Helix's name for a data file), by dragging a relation icon into Helix's main window. You double-click on this icon to open a *relation window*, into which you drag field icons and name them, opening three dialog boxes to set the field's type, format, and validation properties. To complicate matters, some fields are represented by the *abacus* (calculation) icon instead of the field icon and the relation window can also hold icons that represent templates (forms designers), views (actual forms), indexes, and queries — with no graphical clues besides icons to help you make sense of all this.

**Easing Data Entry.** Most of these programs offered all the options we needed for easing or customizing data entry in particular fields. Each program provided ways to create masks, or formatting specifications (so that telephone numbers, for example, are automatically formatted with parentheses and a hyphen), set up pick lists

**Two of the flat-file products are pseudorelational — they can look up information in other databases.**



(so users can choose from several predefined values for a specific field), and create calculated fields.

File Force and Panorama II provide several ready-made input masks, but FileMaker Pro and Helix Express require you to create masks by hand. My Advanced Database includes only one mask, for telephone numbers, but it has an interesting extra feature: It provides a link to the program's auto-dialing feature.

In addition to its input masks, Panorama II offers easy pick lists and a lookup function called Clairvoyance that's unique among these programs. When Clairvoyance is turned on for a field, the program searches the database for previous entries that match the string of characters you're entering and completes the entry for you. Clairvoyance can be convenient if you have only a few choices, such as cities or part names, or if you want to ensure data consistency, such as always having a company spelled the same way. If you accidentally enter values you don't want, you can turn the feature off.

Creating calculated fields in these programs is generally straightforward — you compose a formula by selecting fields and operators (from basic math to complex statistical functions) from a menu of choices. Helix Express uses an unusual iconic approach once again, but here it works fairly well. You create the calculated field (represented by an abacus icon) by dragging fields, values, and/or other formula icons into the holes (called *black boxes*) in preset *calculation tiles*. Although at first it's a bit confusing, the tiles do make it easy to see the relationships within formulas.

Helix Express is the only program that lets you attach a document (actually a pointer to a document), such as a spreadsheet, to a record and then launch the appropriate application to view the document.

FileMaker Pro and Panorama II also support some special attachments. FileMaker Pro supports sound and QuickTime movie files as well as pictures (which all the programs except My Advanced Database also support). Panorama II uses a Flash Art Scrapbook to store pictures and lets you play back sound files from within a macro.

## Relating Data

Setting up our invoice database was a process that varied widely from program to program, because it involved using the relational or semirelational capabilities available in all the programs except My Advanced Database. We used relational capabilities, if they were available, to handle two aspects of our invoice database: multiple product orders per invoice and lookups of information from the employee and customer databases.

**One Invoice, Many Orders.** In creating our invoice database, we wanted each invoice record to have room for order information (quantity, part number, description, unit price, and total price) that could be repeated so we could record the purchase of several different items

on one invoice — even though an invoice would often include only one purchased item.

In a relational-database program, such as File Force and Helix Express, this situation is handled by having the order-information records exist in a separate data file

Figure 1: Lookup Logistics

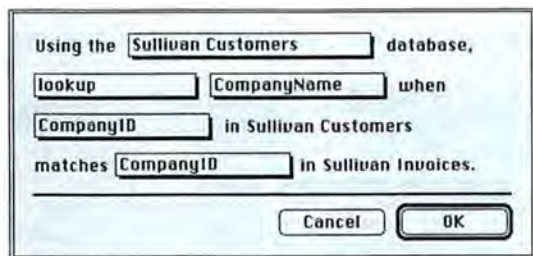
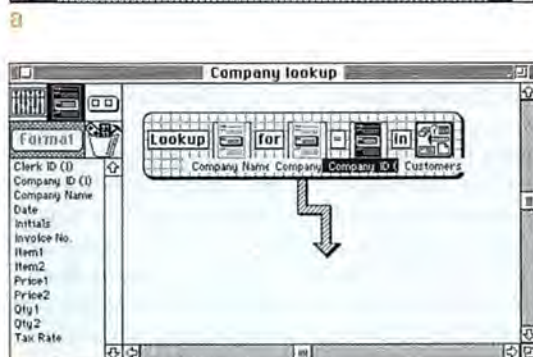
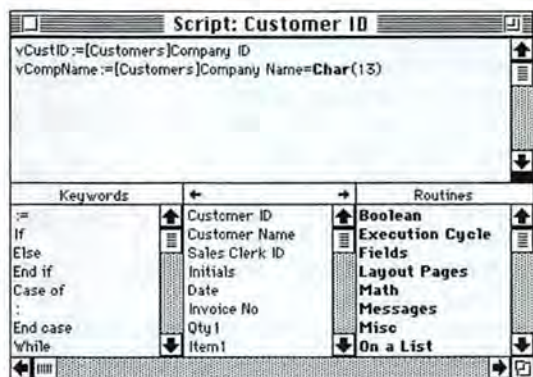


Figure 1: In choosing a database program, consider how easy it is to have one data file look up information from another. In File Force (a), you need to write a script. In Helix Express (b), you drag file icons into a Lookup calculation tile in a particular order. Panorama II (c) and FileMaker Pro (not shown) don't give you all the complex file-linking capabilities you get with the relational-database programs, but they do give you easy dialog boxes for setting up lookups.



## Database Programs

related to the invoice data file. Each invoice can then include any number of orders, and there's no wasted space. However, you need to set up an orders file and link it to the invoice file.

Flat-file-database programs, in contrast, require that the order-information fields be repeated in the invoice database; you determine how many repetitions are enough and how much space you're willing to risk wasting. My Advanced Database provides no special help for creating repeating fields, but the other two flat-file database programs automate the process to some degree. Panorama II creates new fields, such as Qty1, Qty2, Price1, Price2, and so forth. FileMaker Pro simply repeats and displays each field as many times as you like.

**Looking It Up.** Because we already had a database of customer information, we wanted our invoice database to be able to look up information such as customer addresses, so we wouldn't have to enter this information on each invoice. We included a company-ID field in both databases to provide a means for linking the files.

Such lookups are standard in relational-database programs, such as File Force and Helix Express. With these database programs, you're not limited to looking up data from other data files — you can also modify data in other files or even merge information from multiple data files. But these capabilities require a more complex design process than with flat-file-database programs. Both File Force and Helix Express require that all the data files to be linked be created as part of the same database — so you need to plan ahead when you set things up.

File Force uses scripts for setting up links and lets you create scripts with words (see Figure 1a) or flowcharts. Unfortunately, the scripting language is complex and the documentation isn't helpful in clarifying the syntax for nonprogrammers. We'd rather the program placed each function's syntax and name in the scripting window.

Helix Express again uses an icon-based approach — a Lookup calculation tile into which you drag the fields and data files (relations) for the lookup (see Figure 1b). The process takes concentration, because you start with the last hole in the tile and then move to the first, and it's easy to get confused about which relation you're using. The program's documentation does include models to help you, however.

Although the databases in the remaining three programs are not relational, FileMaker Pro and Panorama II each let you look up data in one database and use it in another (My Advanced Database has no lookup capabilities). For most simple database needs, such as with our invoice database, such lookups between separate databases are adequate. FileMaker Pro and Panorama II each use a simple, fill-in-the-blank dialog box to keep you from getting confused when creating a lookup (see Figure 1c). You specify the fields on which to base the link and which data to copy from one database into the other.

### Creating Forms and Reports

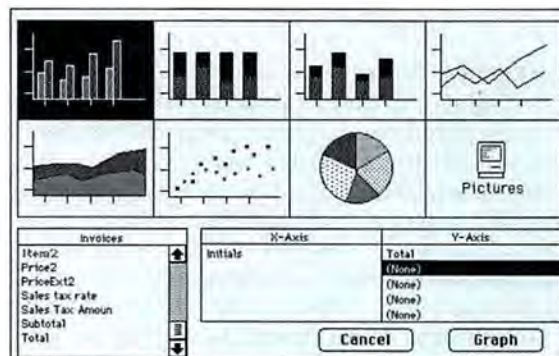
After setting up the fields, you need to create layouts, or views, of the data. Usually that means at least one on-screen input form, with one record per screen, plus

**Relational programs require complex design — so you need to plan ahead when you set things up.**

Figure 2: The Ins and Outs of Database Programs



My Advanced Database doesn't give you much leeway to change its basic data-input form, but it includes lots of preformatted report options for address books, envelopes, and the like.



File Force offers the best selection of graphing options and preformatted layout templates, although its process for creating custom layouts can get complicated.



multiple layouts for viewing and printing the data.

**Flexible Forms.** My Advanced Database is the only one of these programs that doesn't let you do much to customize input forms. It simply puts the fields you've entered in the center of the screen, leaving you little flexibility about how they're arranged, and it doesn't let you add buttons, custom menus, pictures, or macros.

Each of the other four programs includes a grid or template form, similar to that of a drawing program, on which you place the fields you want to use. Besides icons for adding fields, the programs include drawing functions, so you can add lines, boxes, colors, and graphics to your forms. We found Panorama II's mechanisms for placing, sizing, and moving fields and graphic objects to be the most difficult of the bunch — even just lining objects up was tough.

All the programs except My Advanced Database let you add pictures and buttons. Helix Express and File Force also allow custom menus, and FileMaker Pro and Panorama II let you add macros to a macro menu — for example, you might create a macro for a frequent complex search. Panorama II has a macro recorder, but FileMaker Pro requires simple scripting. File Force and Helix Express also require scripting to create macros.

Overall, FileMaker Pro offers the best balance of efficiency and elegance for designing your own forms; placing and moving objects on its layout forms is easy, and the results tend to look better than in Helix Express or Panorama II. File Force offers an extensive design palette and a gorgeous selection of preformatted layout templates, but the templates are so sophisticated that they're hard to customize.

**The Output Outlook.** Getting the data out of databases in these programs is surprisingly straightforward. Most of the programs offer label templates (usually by

Avery-label number), simple lists, and envelopes.

Designing your own output form is a matter of placing the fields you want on a blank form. The tools and options are similar to those for designing input forms, with additional options for adding headers, footers, and page numbers. As with input forms, My Advanced Database doesn't let you customize the format for reports.

Summaries and totals may require creating a separate field, as in FileMaker Pro and Helix Express, or simply selecting an item on a menu, as in File Force, My Advanced Database, and Panorama II.

All five programs export records to a separate text file for later import into a word processor for mail-merge. However, it's generally easier to create each letter as a separate layout and then select and print the letters within the database program.

There are other output options as well. Panorama II offers cross tabs, charts, and graphs as standard reports; we found it the most useful program for reporting numbers, although File Force includes a graph editor that produces especially good-looking graphs. My Advanced Database makes it easy to print address data and other information in standard organizer formats.

### Putting It to Work

To test the day-to-day workability of these programs, we checked how fast they sort records, how efficiently they use disk space, how easily they let you import data, and whether they let many users access one database.

**The Sorted Details.** To check sorting speed, we imported a 1,000-record tab-delimited file into the company database in each program and set up an index (an internal table built to position records in a particular order) on the 10-digit company-ID code. We mixed the records and timed a sort three times, shutting down the



All the programs except My Advanced Database provide a template with drawing tools for creating custom input forms and reports, but FileMaker Pro's is especially easy to use.

Salesclerk	Jan 1993	Feb 1993	Mar 1993	TOTAL
WES		\$5,197.50	\$1,216.00	\$6,415.50
BS	\$1,050.00	\$945.00	\$3,360.00	\$5,355.00
KLS	\$2,178.75	\$918.75	\$1,338.75	\$4,436.25
JPW		\$787.50	\$1,732.50	\$2,520.00
CJK	\$393.75	\$420.00	\$1,632.75	\$2,446.50
BMC			\$892.50	\$892.50
TOTAL	\$3,622.50	\$8,268.75	\$10,174.50	\$22,065.75

If you like tables, you'll like Panorama II's approach. Its default layout is in row-and-column form, and it lets you easily create cross-tab reports (such as quarterly sales broken down by salesperson and month, with totals) just by filling in a simple dialog box.



## Database Programs

system after each test to remove the records from RAM.

We found that the time required for sorting varied widely within the programs (see Figure 3). Panorama II and Helix Express were relatively fast, and File Force and FileMaker Pro were somewhat slower. My Advanced Database was downright poky.

One reason for Panorama II's speed is that the program is RAM-based, unlike the other programs. Because the active database is stored in RAM, you get faster access to data and less battery drainage if you're using it on a PowerBook. However, you risk data loss if you lose power before you've saved your changes (or before the program has, if you've turned on the auto-save feature).

**Fluctuating File Sizes.** We also found that database size varied widely. The 1,000-record database we imported from Excel actually became slightly *smaller* in Panorama II, but it expanded to more than three times its initial size in FileMaker Pro and more than twice its initial size in the other programs. If file space is tight — especially if you expect to take your database program on the road in a PowerBook — you'd be much better off with Panorama II than with FileMaker Pro.

**Matters of Import.** Importing data was easy with all the programs, although most require that the fields in the import file be organized in the same order as those in the destination database. FileMaker Pro wins kudos for letting you match fields in the import file and the database before you import the file.

**Multiple-User Matters.** If you're planning to create a database that multiple users will access, you won't want My Advanced Database; it's strictly a single-user program. FileMaker Pro is the clear choice in multiplatform environments, because users can share data with FileMaker Pro for Windows — and by the time you read this, FileMaker Pro 2.1, which adds Novell NetWare support, should be available. File Force, Helix Express, and Panorama II are Mac-only, but they support multiple users on Mac-based client/server networks with password-controlled access.

### Deciding on a Database Program

In choosing from among these programs, you can't escape a trade-off between abilities and ease of use. My Advanced Database supports its developers' claim that you can build a simple database in five minutes, but the database will be limited in what it can do, and it won't have sharp-looking forms. It's a good, bargain-priced choice for creating quick-and-easy address books, index-card files, and other simple systems. But its lack of lookup abilities makes it easy for businesses to outgrow.

File Force and Helix Express, on the other hand, are true relational-database programs and thus the most flexible and powerful in this group — but they require more planning of your database structure and have a steeper learning curve than the other programs.

If relational capabilities (being able to change values in one data file from another, for example) are important to you, you'd do well to look at File Force. Its slick-looking layout templates and wealth of design controls let you create attractive, customized applications you may well find worth the effort. Although Helix Express is theoretically easier to use, because of its icon-based approach, we often found it more difficult — the icons are nonintuitive, and the terminology is confusing. However, if you want to attach documents to database records, Helix Express is the only way to go.

Our preference for do-it-yourselfers was for the mid-spectrum programs. FileMaker Pro and Panorama II each offer enough pseudorelational abilities (lookups and repeating fields) to handle moderately complex small-business applications as well as personal uses. And they're clearly designed for nonprogrammers, providing fast and easy access to standard database functions.

Which to buy? FileMaker Pro has the edge in looks and ease of use, and it's strong for multiplatform use. If you're concerned with numerical reporting features or if you want a fast and compact RAM-based database program for your PowerBook, go with Panorama II. ☛

Jan Smith is a Boston-based writer and an associate editor for ZiffNet.

**Figure 3: How Long Does It Take to Sort 1,000 Records?**

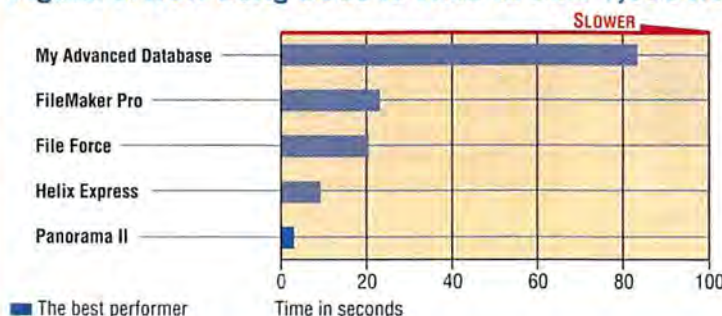


Figure 3: If you hate to wait for sorts, you'll like Panorama II — it stores your database in RAM, so sorts are superfast. When we sorted a 1,000-record database of company information three times with each program, the average sort time for Panorama II was less than 4 seconds compared with 20+ seconds for FileMaker Pro and File Force and more than 80 seconds for My Advanced Database. Helix Express was also fast, taking less than 10 seconds.



**Table 1: Database-Program Buying Basics**

	File Force 1.2	FileMaker Pro 2.0.3	Helix Express 1.0.1	My Advanced Database 4.1	Panorama II 2.1
■ ■ ■ = above average ■ ■ = average ■ = poor NA = not applicable	■■■■	■■■■½	■■■½	■■■	■■■■½
List price	\$395	\$399	\$439	\$59.95	\$395
Pros	Attractive layout templates. Custom menus. Custom graphs. Flexible file linking.	Cross-platform file sharing. Easy setup, layout. Unlimited sorting options. Spelling checker. Repeating fields.	Customizable menus. Can attach documents to records. Fast sorting. Flexible file linking.	Fast setup. Most commands on one screen. Flexible importing. Auto-dialer. Inexpensive. Address-book output.	Charts and cross-tab reports. Fast sorting. Repeating fields. Helpful tutorial. Small file size.
Cons	Layout templates are hard to adjust. Complex. Poorly documented scripting.	Large file size.	Unusual interface. Documentation is difficult to navigate.	No lookup between files. Slow sorting. No custom layouts. Not multiuser.	Time-consuming layout design.
Setup					
Ease of defining fields	■ ■	■ ■ ■	■	■ ■ ■	■ ■
Extensiveness of entry options (pick lists, masking, calculated fields)	■ ■ ■	■ ■	■ ■	■ ■	■ ■ ■
Variety of attachments supported (pictures, sounds, movies, documents)	■ ■	■ ■	■ ■ ■	■	■ ■
Ease of creating repeating fields or subrecords	■ ■	■ ■ ■	■ ■	NA	■ ■ ■
Ease of creating lookups	■	■ ■ ■	■	NA	■ ■ ■
Forms and reports					
Variety and quality of supplied templates	■ ■ ■	■ ■	■	■ ■	■ ■
Ease of creating custom layouts	■	■ ■ ■	■ ■	NA	■
Extensiveness of design tools	■ ■ ■	■ ■	■ ■	NA	■ ■
Availability of special report options (labels, cross tabs, graphs, organizers)	■ ■ ■	■ ■	■ ■	■ ■	■ ■ ■
Daily use					
Sorting speed	■ ■	■ ■	■ ■ ■	■	■ ■ ■
Compactness of files	■ ■	■	■ ■	■ ■	■ ■ ■
Ease of importing data	■ ■	■ ■ ■	■ ■	■ ■	■ ■
Extensiveness of multiuser capabilities	■ ■	■ ■ ■	■ ■	NA	■ ■
Documentation and support					
Helpfulness of documentation	■ ■	■ ■ ■	■	■ ■	■ ■ ■
Availability of tech support	■ ■	■ ■ ■	■ ■	■ ■	■ ■
Company	ACI US, Inc. 10351 Bubb Rd. Cupertino, CA 95014 408-252-4444 408-252-4829 (fax)	Clarix Corp. 5201 Patrick Henry Dr. Santa Clara, CA 95052 408-727-8227	Helix Technologies 4100 Commercial Ave. Northbrook, IL 60062 708-205-1669 708-291-7091 (fax)	My Software Company 1259 El Camino Real Ste. 167 Menlo Park, CA 94025 415-473-3600	ProVUE Development 15180 Transistor Ln. Huntington Beach, CA 92649 714-892-8199



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Santa Barbara, CA 93101  
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(805) 963-2228 FAX  
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Tarzana, CA 91356  
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(818) 776-0240 FAX  
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Mario Assadi  
1715 University Ave.  
Berkeley, CA 94703  
(510) 843-8171  
(800) MY-TULIP (CA only)  
(510) 843-1870 FAX  
(510) 843-0906 MODEM  
IRIS SmartJet 4012, IRIS 3047 (2)

Tulip's specialized services include color scanning from a Hell 3800, photo-retouching on Macintosh™ Quadra™ 950s, PostScript imagesetting on an Agfa® SelectSet 7000 (22"x26") and on a Linotype-Hell 3030 R (30"x44"), color separations, electronic stripping, and film color proofs. We also offer IRIS digital color prints on matte, semi-matte, glossy, transite, canvas, and archival rag paper.

## ILLINOIS

### 8. AnzoGraphics

Tony Mraz/Steve Moore  
770 North LaSalle Street, Suite 800  
Chicago, IL 60610  
(312) 642-8973  
(312) 337-0150 FAX  
(312) 642-4937 MODEM  
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Portland, OR 97209  
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(503) 223-4601 FAX  
(503) 223-0314 MODEM  
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## UTAH

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Kevin Despain  
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(801) 466-5999 FAX  
(801) 466-5999 MODEM  
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Rastar Color brings a high level of technical competence to the ever-changing field of electronic prepress services. We specialize in merging the world of professional publishing with traditional prepress operations, providing greater flexibility and control over your color projects. Rastar offers a variety of prepress and PostScript imaging services, including IRIS proofs, drum scans, digital film separations, and custom image manipulation.

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(206) 286-8237 FAX  
(206) 286-1998 MODEM  
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Seattle, WA 98109  
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(800) 967-3714  
(206) 284-9664 FAX  
(206) 285-9665 MODEM  
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# *Desktop Video:* **First Cuts**

**Are you ready  
for desktop  
video? Or more  
important, is it  
ready for you?**

**BY LISA RUDMAN**

*W*hen desktop publishing first appeared in 1985, some people dismissed it as a high-end, niche technology: Those color scanners, monitors, and printers — and all that complicated page-layout software — were just expensive toys for a handful of well-heeled designers. Desktop publishing (or, as it was soon called, DTP) wasn't relevant to average business Mac users, right?

Wrong. DTP has become an ongoing revolution that brings document production of all kinds out of the service bureau and into your office, where it's cheaper and easier to control. Now, a similar revolution promises to change the way you produce videos. It's called desktop video (DTV). Everyone from multimedia authors in marketing-department cubicles to professional video editors in half-million-dollar editing suites has something to gain.

To help you understand how DTV can change your world, we've provided overviews of both the traditional video-production process and the brave new way (see Figure 1). We've also provided a glossary (see the "Videospeak" sidebar) of some common video jargon.





ROLL

13

SCENE

DTV  
OPENER

TAKE

13

Director

L Rudman

Camera

3A

Date

10-6-93

MOORE

SORRANTE Film Accessories

WHITE



## Desktop Video Systems

DTV requires an investment in hardware as well as software, and vendors are lining up to provide integrated packages to get you started. To help demystify the new crop of

digital, or desktop, video-editing systems, MacUser Labs tested five of the leading contenders. Although they differ in their overall mission, all these products compress and

digitize video footage from videotape; let you edit those digitized clips in a random-access, or *nonlinear*, fashion; and then let you export the finished piece back to videotape.

Rooted in the old off-line/on-line paradigm, the Digital F/X Video F/X Plus (\$15,995 list) lets you control video decks as you would in a traditional analog on-line editing suite. The Video F/X Plus has a disk-assisted mode with which you can digitize and edit clips in a small window on the Mac for previsualization.

The Avid Media Composer 400S (\$9,995 list) is the entry-level member of a family of products aimed at video professionals. The Media Composer 400S can export an EDL (Edit Decision List) to a floppy disk as well as let you produce low-resolution, full-screen presentations on your Mac that you can export to tape. Other products in the Media Composer family offer a variety of features and resolutions.

Of particular interest to multimedia authors are the RasterOps Editing Aces Suite (\$3,899 list) and the SuperMac DigitalFilm Deluxe (\$5,995 list), each of which can digitize, compress, and edit video clips on the Mac and then allow you to export your presentation to tape or create an EDL for use in a traditional on-line suite.

The Avid Media Suite Pro (\$9,995 list) also allows you to edit clips on the Macintosh, play them back at full-screen resolution, and export them to tape at about home-video-tape quality.

Whichever product you choose, the cost of the desktop-video package is small compared with the cost of the computer system you'll need to run it (see Figure 2).

### The Torture Test

We tested these products the way you'd actually use them. We assembled a team of video and multimedia producers to use each product to create a five-minute piece. Pacific Video Resources, a San Francisco

## Videospeak

**A/B Roll:** a process that uses two sources whose content is mixed during an edit to create a dissolve, wipe, or effect. Used another way, the term *B Roll* refers to video footage that is edited over a voice to illustrate the points being made.

**artifact:** an area within an image or a characteristic of an image—for example, weird shimmering, jaggies, or other undesirable distortion—that is the result of a system limitation.

**audio, 8-bit, 22-kilohertz mono:** standard Mac audio quality, roughly equivalent to that of AM radio.

**audio, 16-bit, 44-kilohertz stereo:** CD-quality audio.

**Betacam:** professional component-video 1/2-inch recording format.

**bin:** a place for storing clips.

**clip:** as a noun, a piece of footage.

**component RGB video:** red, green, blue, and luminance signals are processed as separate signals (or components), thus achieving higher quality. Generally found only in professional video products.

**composite video:** a video signal that combines chrominance (color) and luminance (black, white, and gray) information into one signal. Used by most consumer-grade video products.

**digital scrubbing:** usually refers to audio scrubbing, reading back and forth over a small portion of audio to locate a precise edit point.

**dub:** a copy of a master tape, usually at a lower resolution, for off-line editing.

**editing suite:** a collection of equipment for editing video.

**EDL:** Edit Decision List, a text file created by the editing application that describes all edits in your piece. An on-line editing system can read an EDL and create your finished piece, using your original source tapes.

**field/frame:** NTSC video is made up of 30 frames per second. Each frame has two fields, one for every even scan line and the other for every odd scan line, so NTSC video has 60 fields per second.

**generation:** in analog editing, each time you rerecord or make a copy, you create another generation of the tape or "go down another generation." Each new generation loses signal quality, hence the term *generation loss*.

**in point:** the first frame of a clip.

**JPEG:** Joint Photographic Experts Group, the standard for still-picture data compression that is now being modified as *motion JPEG* for video compression.

**linear editing:** central to the old paradigm of using tape, editing from data stored on media that is not instantly accessible because of the continuous and linear layout of the data and therefore slower than nonlinear editing.

**nonlinear editing:** central to the new paradigm, editing from data stored on a digital storage device, which allows for speedy random access of clips.

**NTSC:** National Television Standards Committee, which defined the 525-line, 30-frame-per-second TV standard currently used in North America, Japan, and much of Latin America.

**off-line:** in traditional editing, the stage at which most content and editing decisions are made—usually on less expensive equipment and using dubs (or *work prints*) of the original source material. At this stage, an EDL is often created to facilitate an on-line session.

**on-line:** in traditional editing, the stage at which the final tape is made. Editing that takes place on more-expensive equipment that recuts a piece, using the original or lowest-generation material, and adds all finishing touches.

**out point:** the last frame of a clip.

**protocol:** the language that is used to control a video deck.

**S-video, or Y/C video:** Y (luminance) and C (color) information is on separate signals and is of higher quality than composite. Available on some consumer-grade video products.

**SMPTE time code, or SMPTE:** Society of Motion Picture and Television Engineers' system of giving each frame of video a unique number to allow indexing and precise tape control.

**storyboard:** a visualization of the order of a piece, using representative frames from each shot or sequence to show a visual skeleton of the piece.

**trim:** the process of adjusting the length of a clip or other element. Editors use this feature to quickly, precisely, and only slightly change a clip's in or out points.

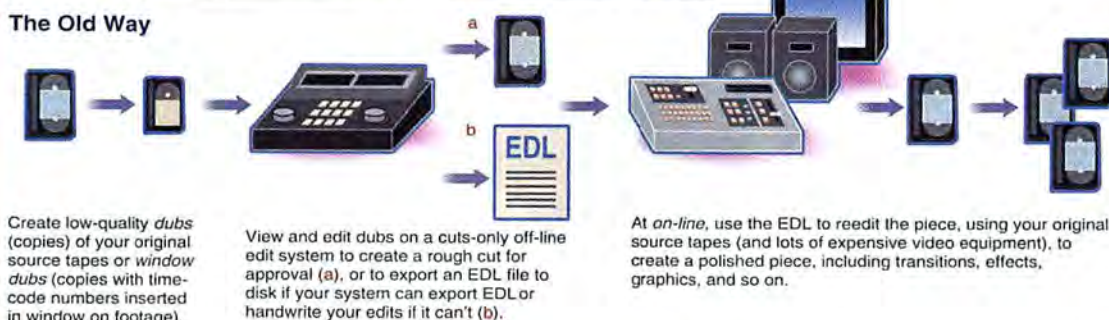
**waveform, or vectorscope:** equipment used in analog video to precisely analyze the various parts of the video signal.



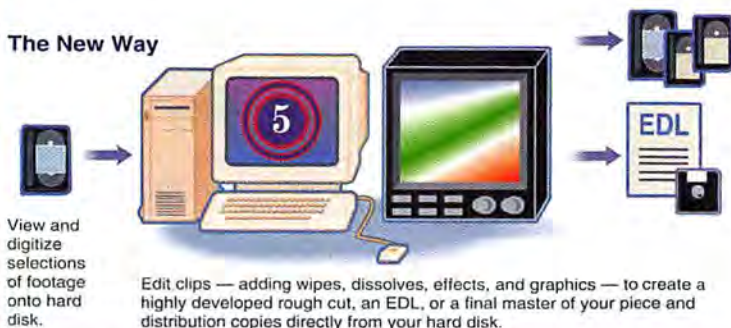


## Figure 1: Old School/New School

### The Old Way



### The New Way



**Figure 1:** Even if you use a DTV system solely to create an EDL, you've previsualized and preapproved effects before the on-line session, instead of doing this on-line while the meter's running. In addition, if your client wants another version of the piece a month later, changes are a snap, with no massive reediting or generation loss.

Bay Area postproduction facility, supplied scripts and S-VHS copies of BetacamSP originals. Our piece had more than 80 elements, including transitions, effects, music, animations, graphics, and text (see the "How We Tested DTV Systems" sidebar).

Ease of installation means different things to different people. Mac users have come to expect plug-and-play installation, whereas folks from the video world are more used to piles of cables, external boxes, and VCRs. Overall, we found the installation of these products straightforward, although what each product consists of varies dramatically.

The SuperMac DigitalFilm Deluxe, with its NuBus-card/daughter-card arrangement, was the easiest to install. An external breakout box — with audio and video connectors and an encoder for exporting your edited piece to tape — connects via cable to the NuBus card, once you've installed the card in your Mac. The

DigitalFilm Deluxe includes Adobe Premiere 2.01 editing software and Premiere's built-in tutorial.

The RasterOps Editing Aces Suite has a similar NuBus-card/daughter-card arrangement, but it's more modular: The daughtercard is designed to work with several other RasterOps digitizing cards and is available separately. The Editing Aces Suite consists of a MediaTime card; a MoviePak daughtercard; a breakout box for connecting VCRs; a separate encoder; Adobe Premiere 2.01; and Media Grabber, RasterOps' own digitizing software.

The Avid Media Suite Pro was easy to install, even though it includes a compression/digitizing-board set, an AudioMedia II card for sound, and an ATTO Silicon Express SCSI-2 card for connecting hard drives. It also includes its own editing software, a HyperCard tutorial, and a helpful training video. The setup guide is useful, but the main user guide is not very thorough.

The documentation for the Avid Media Composer 400S is much better: The extensive manual provides clear warnings and hints, especially pertaining to digitizing and storage, and important points are highlighted and easy to find. Installation is straightforward as well, considering the product's many cables and NuBus cards.

The Digital F/X Video F/X Plus, with its video connectors and cables, will seem familiar to video editors. In addition to installing a digitizing card in your Mac, you install as many as 12 cables to connect three VCRs; your Mac; and the Video F/X Plus' external box, which contains video and audio switchers. Clear documentation and helpful tutorial tapes are provided. Video F/X Plus' main manual is clearly written, but it needs some updating. The product comes with editing software; TypeStyler, a type-modification application; and TextureSynth, a nifty texture-creation application.





### Figure 2: When \$20,000 Equals \$80,000

#### Nonlinear DTV System

##### Professional VCR (S-VHS editing recorder/player): \$6,000

The quality of your source material is crucial, so you'll want as high-end a VCR as you can afford. Using one deck instead of the three you'd need for traditional analog editing saves money. There's also less wear and tear on the VCR, because you use it only to play footage into the Mac and record your edited piece, instead of searching, pausing, and shuttling as you would with linear editing.



##### Audio speakers: \$400 for two

We highly recommend portable, self-amplified stereo speakers for audio editing.



##### High-end Mac: \$6,000

##### 64 MB of RAM: \$4,000

##### Nonlinear DTV hardware and software for digitizing, compressing, and editing video footage: \$4,500

##### Fast SCSI-2 2-gigabyte disk array: \$5,000

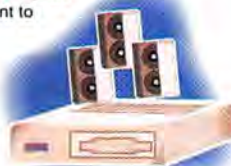
##### RGB monitor for the Mac: \$1,000

The RGB monitor shows you the editing application and windows. The larger the monitor, the more space you have for layout and for seeing the multiple windows used in DTV.



##### Backup system: \$1,500

Of course, you'll want to back up your hard disks as a safety measure. But backup systems also provide a method of archiving video elements your hard disk alone can't accommodate.



##### NTSC monitor: \$1,000

Here's where you view your original footage from your VCR and view it again after it's been edited and encoded back into NTSC for output to tape. Make sure you have a high-resolution (at least 400 lines) NTSC monitor with separate audio and video inputs.



Figure 2: System configurations and specifications vary, but you can expect to pay \$20,000 to \$35,000 for a nonlinear DTV Mac system. It sounds like a lot until you consider the cost — \$80,000 to \$100,000 — of a traditional linear A/B Roll editing suite.

#### Grab It, Make It Small

To bring video into your Mac, you must convert the signal from analog to digital and squeeze the resulting data down to a size the Mac can handle. Each of the products we looked at captures only 30 of the 60 fields of video displayed each second. Some of the products also capture only smaller video windows, and therefore less data, even though they can display at full screen size.

There are obvious trade-offs between file size and quality, and the best products give you a variety of compression settings. This variety lets you choose a setting based on whether you're creating a draft or final version of your piece or on how you will distribute it — on CD-ROM or on tape.

The RasterOps Editing Aces Suite

offers compression ratios from 5:1 to 120:1; the SuperMac DigitalFilm Deluxe offers only ratios from 25:1 to 50:1. Using the Least compression setting, a one-minute, 320-x-240-pixel clip captured with the Editing Aces Suite occupied 11 megabytes; with the DigitalFilm Deluxe it occupied 16 megabytes.

Avid's Media Composer family gives you five compression/resolution choices. The model 400S offers only the two lowest-quality settings, which are fine for rough cutting and generating an EDL. At the lowest-quality setting, our one-minute clip occupied about 21 megabytes.

The Digital F/X Video F/X Plus digitizes at one extremely low resolution. We expected a clip captured with it to occupy the least disk space, but our one minute of digitized video

filled approximately 23 megabytes.

The Avid Media Suite Pro offers only one, high-quality compression setting, which consumed 68 megabytes per minute.

#### Talkies Too

In QuickTime, audio is not compressed, so it can comprise a large part of the data stream when you're digitizing. The result is that including high-quality audio can have a serious impact on the quality of the video portion. QuickTime makes room for audio data by dropping video frames if necessary. Additionally, the higher the sound quality, the more hard-disk space you need: One minute of 8-bit, 22-kilohertz sound occupies about 1,328K in mono and 2,640K in stereo; one minute of 16-bit, 44-kilohertz sound



occupies approximately 5,232K in mono and 10,448K in stereo.

The RasterOps Editing Aces Suite supports low-resolution 8-bit audio as well as 16-bit CD-quality stereo sound. Unless you have Apple's new Sound Manager 3.0 and QuickTime 1.6, however, your Mac can play back only mono sound with QuickTime movies and 8-bit stereo otherwise. Both Avid products we tested avoid this snag entirely by piping sound through the AudioMedia II card. The Avid Media Suite Pro, however, digitizes only at the highest-quality level, consuming lots of disk space. The SuperMac DigitalFilm Deluxe also offers stereo sound but of a lower quality.

#### Order from Chaos

Nonlinear editing is great, but only if you know where your clips are. All the products we tested let you name a digitized clip as you save it,

but each product handles *logging* — organizing, sorting, and recording comments — differently.

Adobe Premiere 2.01, the editing application used by both the RasterOps Editing Aces Suite and the SuperMac DigitalFilm Deluxe, has only basic logging functions. As each clip is digitized, it's represented in the project window as a thumbnail image of the clip's first frame. Premiere automatically lists essential information, including the clip's duration and screen dimensions.

The Video F/X Plus editing software lets you export your log to a third-party database program, but that is no match for the built-in customizable logging and sort/sift retrieval features of Avid's editing software.

#### Putting It All Together

After you've digitized and organized your clips, it's time to edit them. Editing consists of trimming

## Trends

The systems described in this report, without the help of a post-production facility, offer only home-VCR quality at best. Because of current hardware constraints, video data must be compressed. To cut the data down to size, these products start by removing every other field (there are normally 60 per second). The result is an image that has noticeably jagged lines or overall fuzziness. But the future is full of systems offering image quality close to what you might see on television.

● **New products will be able to capture all 60 fields.** New products such as the Data Translations Media 100, the IMMI VideoCube, the Radius VideoVision Suite, and the RasterOps MoviePak II digitizing card will offer 60-field performance. The VideoCube is unique in that it offers true real-time effects and four-track (eight-channel) audio processing. Sold in two configurations — one based on a Mac IIvx and the other on a Mac Quadra 800 — the system stores one hour of 60-field video and two hours of CD-quality audio and costs a little less than \$40,000. Storage is expandable but expensive, because IMMI forces you to buy proprietary disk arrays.

● **Variable-compression algorithms will make their debut.** By the time you read this, Radius should be shipping the VideoVision Studio. This product will offer 60-field video and auto-configurable compression, which adjusts compression ratios on the fly as video is digitized.

● **Editing applications will offer more-sophisticated features and streamlined interfaces.** Adobe has greatly improved Premiere's customizability in version 3.0. Key improvements include multiple presets for generating movies designed for different media (CD-ROM, hard disk, and videotape); new field-rendering capability for tape output; and the option to disable redraw in the construction window, which speeds up maneuvering through long projects.

Since being purchased by Avid, DIVA has released a new version of VideoShop, its QuickTime editing software. Version 2.0 features an improved interface and greatly simplified clip management. Expect future Avid/DIVA products to borrow interface elements from each other.

— Julian Steinberg



## How We Tested DTV Systems

To evaluate each product's key features and overall ease of use, we created a five-minute presentation. The source material consisted of more than 80 clips of ZD Labs as part of an introductory presentation shot in BetacamSP by Pacific Video Resources, an all-digital post-production facility based in San Francisco. The source tapes were then dubbed to S-VHS.

We gave these tapes and a script to our testing team, which included a corporate/industrial-video producer with extensive experience with traditional editing methods and a Mac multimedia producer steeped in the latest 3-D graphics, animation, and QuickTime applications. Before they started, our testers installed each video-editing system according to the vendor's instructions.

We then asked our testers to create a mock presentation, using each of the products. Just before the completion of each presentation, we directed our testers to make a last-minute change, to test each product's flexibility.

A Mac Quadra 950 with 64 megabytes of RAM, running System 7.1, and a 2-gigabyte internal FWB disk array served as our standard testing platform.

A DiaQuest DQ-AniMac board, which is designed for exporting single frames of video or animations, was used with both the SuperMac DigitalFilm Deluxe and the RasterOps Editing Aces Suite to capture SMPTE time code from our source tapes, because these products offered no other way to do this at test time.

To round out our editing system, we used Ikegami NTSC monitors and a Panasonic S-VHS record deck and two S-VHS play decks (when testing the Digital F/X Video F/X Plus). For the final presentations, we used a Mackie Designs audio mixer with a three-piece speaker system, from Atlantic Technologies.

After completing our presentation on all the systems, we showed the finished tapes to a jury of video and multimedia producers and asked them to rate each tape based on the quality of the video, sound, animations, and overall smoothness of motion.

To ensure that each product could generate a usable EDL, we exported a variety of EDLs from each product and attempted to re-create our presentation with the original master tapes at Pacific Video Resources' on-line-editing facility.

— Lisa Rudman



## Desktop Video Systems

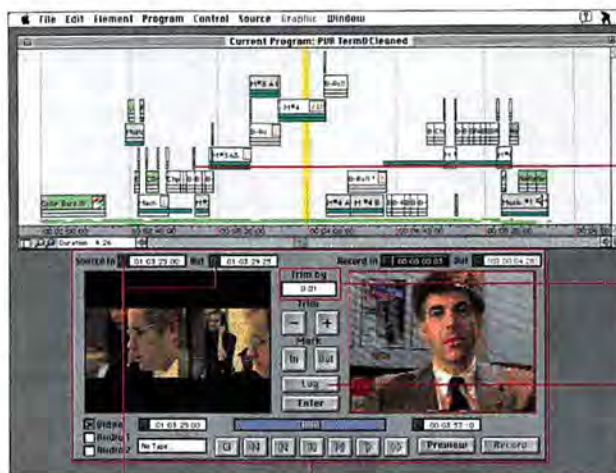
clips to the length you want, putting them in order, applying transitions (dissolves, wipes, effects) between them, and adding graphics or text.

The *time line*, or *construction window*, is the assembly point for your piece: You drag and drop your clips and other elements into it. All the editing software except Digital F/X's for the Video F/X Plus — which uses a hierarchical, or "stacked," time line (see Figure 3) — uses a ribbon or track-style time line (see Figures 4, 5, and 6). With a track-style time line, you place video clips in a video track and audio elements in a separate audio track. With a hierarchical time line, you can place elements anywhere within the time line and the elements have identifiers (for video, audio, graphics, and so on).

With the hierarchical viewing style, elements you've overwritten are still displayed but they're grayed out, although you can easily move them to the active layer if you change your mind. Although it offers flexibility, we think this method can be confusing for complex projects. More disturbing was the frequency with which the Video F/X Plus editing software crashed on our test systems — a two-year-old product ought to be more stable.

Adobe Premiere uses Macintosh-standard dragging and dropping for placing and arranging clips in its time line (see Figure 4). However, we preferred the speedy time-line navigation, helpful customizable keyboard shortcuts, and simpler and more powerful interfaces of Avid's software.

The editing software in all the products we tested provided various time-line *ripple* functions, letting you remove a section from the middle of a sequence and close the resulting gap — something you just can't do with tape. Trimming clips is also important, and although Premiere's click-and-drag trimming method is very Mac-like, the Avid software's highly visual Trim mode wowed us with its functionality.



The cueing buttons are handy.

The control-window layout will look familiar to video professionals, yet the source and record monitors are small and the image quality is poor.

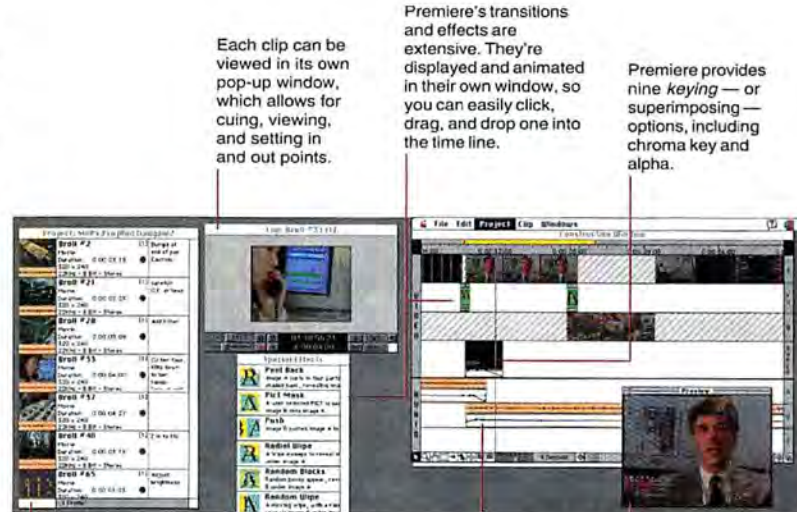
The audio is poorly visualized as two thin horizontal bars along the bottom of each clip. Reading through the audio portion of the time line is difficult when a piece includes multiple audio cuts.

The trim function is not at all visual.

The Video F/X Plus software gives you the nice option of logging without digitizing, while still capturing a keyframe for you to use for storyboarding and clip identification.

**Figure 3: Video F/X Plus Software Interface**

Time lines are an area of personal preference, so we suggest you take any of these interfaces for a serious test drive. We thought the Video F/X Plus software's time line was cluttered, and changes in clip position created confusion. One advantage of this hierarchical arrangement is that you can create layers of video-clip choices.



Each clip can be viewed in its own pop-up window, which allows for cueing, viewing, and setting in and out points.

Premiere's transitions and effects are extensive. They're displayed and animated in their own window, so you can easily click, drag, and drop one into the time line.

Premiere provides nine *keying* — or superimposing — options, including chroma key and alpha.

The project window provides basic clip information plus room for your comments, but it has no database-like functions such as sorting.

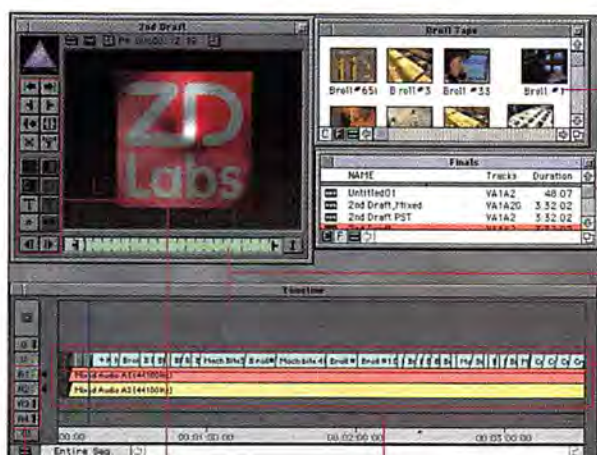
Premiere has three tracks of audio, which can play simultaneously. Mixing audio clips is flexible and graphical: You can control the volume anywhere within a clip by using the audio-fade control section at the bottom of each audio clip.

Previewing effects can be time-consuming, especially when a sequence is complex. Audio and video sometimes play out of synchronization.

**Figure 4: Adobe Premiere Interface**

The Adobe Premiere 2.01 interface used by the SuperMac DigitalFilm Deluxe and the RasterOps Editing Aces Suite is big, bold, and the most Mac-like in the way clips are manipulated in the time line, or construction window. It has superior graphics and effects tools plus flexible audio controls. By the time you read this, Premiere 3.0 will have made a good thing even better.





Bins can be in frame view or custom view. You can add statistical columns such as duration or audio quality and sort clips in an efficient database-like manner.

The Media Suite Pro software has great interactivity between the program and time-line windows.

Unfortunately, all of the Media Suite Pro software's transitions and effects are too subtly represented, with a diagonal line between clips in the time line.

You can load clips into any of four audio tracks, but you can play only two simultaneously.

The efficient program window has user-customizable buttons and feature-rich, pull-down menus.

At this particular time-line magnification, you can see the clips for an entire 3.5-minute piece. A filmstrip-style view is available on the track above the graphics (G) track.

## Figure 5: Media Suite Pro Software Interface

The Media Suite Pro software interface is logically designed and easy to learn. You can further increase its already fast speed by using keyboard shortcuts and user-customizable buttons. It has extensive editing features, including a visual trim process.

Here a bin is partially expanded to show just some of the many logging columns it might contain.

The edit panel between the source and record "monitors" provides easy-to-access splice and overwrite buttons.



As in many of the products we tested, clip keyframes can be rearranged in a bin to create a storyboard.

As with the Media Suite Pro software, graphics are on a separate track and are not composited with the video track until you do a "graphics mix down." This allows for easy repositioning of the graphics within the time line.

Unlike the Video F/X Plus editing software, version 4.5 of the Media Composer software does not have a way of expressing numerous video layers or video-editing options in a stack. The new version, 5.0, will allow for multiple layers of video within the video track.

## Figure 6: Media Composer Software Interface

The Media Composer software, version 4.5, that comes with the Avid Media Composer 400S is highly evolved and feature-rich. Although it's similar to the Media Suite Pro software in time-line, bin, and user-assignable-button design, the Media Composer software interface has a more spacious feeling, perhaps because it has separate windows for source clips and recorded clips.

## Powerful Transitions

One of the advantages of DTV over traditional off-line editing is that you can perform transitions, such as wipes, where you once could only afford to do cuts. The Digital F/X Video F/X Plus performed impressively smooth dissolves and wipes when it was constructing transitions on actual videotapes, but only crude approximations of the transitions appeared on the Mac screen.

The Media Composer software performed smooth digital dissolves, but it doesn't offer wipes or effects. You can add Avid's Pre-Visualization package #1, which contains 34 wipes plus motion control, for an extra \$4,500.

Adobe Premiere graphically displays numerous dissolve, wipe, and effect options as animated icons in an effects window. Unfortunately, Premiere is slow in allowing you to preview its transitions.

The Media Suite Pro editing software (see Figure 5) offers fewer effects but previews them more quickly than Premiere does.

DTV systems should let you include graphics, titles, and animations within presentations. Adobe Premiere 2.01 has extensive graphics capabilities, including sophisticated Photoshop filters. With the Media Suite Pro software, graphics creation is limited to a built-in titler, but you can import PICT files and PICS animations. It doesn't have the graphics/effects bells and whistles Premiere does, but it provides fast and flexible titles; offers smooth effects; and supports imported graphics and animations with little of the aliasing, tearing, or other artifacts common in the rest of the products.

The Video F/X Plus software includes a rudimentary graphics-creation feature, but it can import PICT, PICT2, EPS, or EPS Text formats and it has good analog graphics and title quality. The Media Composer software has no native graphics capabilities, and as with that of the Video F/X Plus, you're expected



## Desktop Video Systems

to create your graphics in another application and import them.

Once you've completed your project, you'll want to distribute it. Currently, using videotape is the most economical way to do this. The Digital F/X Video F/X Plus has no trouble making a good tape, because it's designed to make a master tape by assembling your source tapes.

For the remaining products, you must export your finished piece through a digital-to-analog encoder to put it on tape. We played all the tapes for a jury of video and computer professionals to see which video systems had produced the best results. Both the RasterOps Editing Aces Suite and the SuperMac DigitalFilm Deluxe had produced noticeably jerky motion from time to time — more frequently in the case of the DigitalFilm Deluxe.

The jerkiness could be attributable to QuickTime itself. QuickTime moves data in small chunks, much as the Finder does. It's more difficult to push through lots of little data chunks than it is fewer larger chunks. The SuperMac DigitalFilm Deluxe tries to get around this problem by creating its own export plug-in for Premiere, which bypasses QuickTime for playback. Both Avid systems bypass QuickTime as well. Our jury felt that the Avid Media Suite Pro produced the best overall video and audio quality.

### Decisions, Decisions

Even as DTV features and video-output quality continue to improve, EDLs give you the option of easily reediting from your original tapes.

Premiere's EDLs performed well, except for a few glitches, such as incorrect descriptions of transitions. The Video F/X Plus software supports more EDL formats than Premiere does and it did well on the transitions, but it didn't list some fade-ups/fade-downs. The Media Composer software's EDL performed well. The Media Suite Pro software we tested couldn't export

an EDL; however, we found that the software's project file could be read by the Media Composer software to create an EDL. (Version 2.0 of the Media Suite Pro software, which began shipping after we completed our testing, *can* export EDLs.)

### Get the Job Done

The future of DTV lies in fully digital desktop video systems. If you're a video professional about to replace your old analog off-line system, you should seriously consider the DTV realm. But be clear about what you need a product to do, in view of the way you're currently working. Because of storage constraints and costs, these products are currently best suited for short pieces. If you're a multimedia author wanting to take advantage of the power of video, consider the total cost of DTV, including a Quadra, lots of RAM, storage, and a backup system.

### The Bottom Line

Given all the "betaness" of many of the products we tested for this report and their generally disappointing video-output quality, we suggest you wait before diving into this new field. Better image quality, more-

stable software, and probably lower prices will quickly make the batch of products tested here obsolete.

On the other hand, multimedia authors who can afford these products with the computer systems they require should consider the RasterOps Editing Aces Suite (\$3,899 list, \$3,615 street). Its variable compression settings and the quality of its playback to screen, along with the bundled Adobe Premiere 2.01's great graphics and effects, make it a powerful multimedia tool.

If you're a professional video editor who can't wait for the next generation of products, your best bet is the Avid Media Suite Pro (\$9,995 list, \$9,500 street). Its superior editing software, speed, and image quality were the best of the bunch. And with the EDL support and 60-field-per-second capture added in its most recent release, Media Suite Pro has just become even better.

Lisa Rudman is a video producer/editor in Oakland, California. Her company, Activision, specializes in videos for businesses and nonprofit groups and is catching the DTV wave. Julian Steinberg is a San Francisco-based multimedia developer. Jeffrey K. Milstead, a *MacUser* project leader, managed the testing for this report.

## Table 1 Criteria

**List price** — The vendor's suggested retail price.

**Street price** — The average selling price through mail order or at dealers surveyed across the U.S. in June 1993.

**Control protocols** — The protocols the editing application supports to control video recorders.

**SMPTE-time-code capture** — Does the editing system have a means of reading in time code from your source tapes?

**QuickTime in/out** — Can you import and export QuickTime?

**Image-quality control** — The image variables you can alter.

**Graphics handling** — The file formats the editing software supports.

**EDL-export support** — Does the video-editing application allow you to create and export an Edit Decision List?

**Transitions/effects** — The total number of transitions and effects the editing application offers.

**Preview transitions/effects** — Does the editing software let you preview your transitions and effects?

**Highest audio resolution** — The highest-quality audio supported, given in terms of bit depth and sample rate.

**Number of audio tracks** — The number of audio tracks the editing application provides.

**Audio controls** — The audio variables you can adjust from within the editing application.

**Digital scrubbing** — Does the editing system let you read back and forth over small portions of video and audio to locate precise editing points?

**Configuration** — The vendor's recommended system configuration.



## Table 1: Features of Desktop Video Systems

	Avid Media Composer 400S \$\$\$	▶ Avid Media Suite Pro \$\$\$	Digital F/X Video F/X Plus \$\$\$½	▶ RasterOps Editing Aces Suite \$\$\$	SuperMac DigitalFilm Deluxe \$\$\$½
List price	\$9,995	\$9,995	\$15,995	\$3,899	\$5,995
Street price	\$9,995	\$9,500	\$15,995	\$3,615	\$4,835
Pros	Excellent EDL support. Best editing software.	Excellent editing software. Fast. Good output to tape.	Highest-quality video output. Excellent EDL support.	Inexpensive. High-quality audio. Good editing software.	Good software bundle. Good editing software.
Cons	Expensive upgrade required for effects beyond dissolves.	No EDL support.* Only one compression setting.	Poor digital video. Compatibility problems.	Took a couple of card combinations to work. No time code in.	Requires Quadra 950, disk array. Poor audio quality. Jerky video motion.
<b>Hardware</b>					
Video inputs	composite NTSC, S-video	composite NTSC, S-video	composite NTSC, S-video	composite NTSC, S-video	composite NTSC and PAL, S-video
Control protocols	RS-422/Sony 9-pin serial	RS-422/Sony 9-pin serial, VLAN	RS-422/Sony 9-pin serial	VISCA, VLAN, ARTI, Sony 9-pin serial	VISCA, VLAN, ARTI, Sony 9-pin serial
SMPTE-time-code capture	yes (and film options)	yes	yes	no	yes (via DiaQuest cable and software)
QuickTime in/out	out only	out only (160 x 120 pixels)	out only	yes	yes
<b>Software</b>					
Image-quality control	waveform/vectorscope window	waveform/vectorscope window	brightness, color, contrast, tint	hue, saturation, brightness, contrast, sharpness, black level, white level	hue, saturation, brightness, contrast, sharpness, black level, white level
Graphics handling	imports QuickTime, PICT, PICS, OMF	built-in titling, graphics keying, PICT, PICS	PICT, PICT2, EPS, PostScript fonts	any Mac graphics	any Mac graphics
EDL-export support	yes	no*	yes	yes	yes
Transitions/effects	NA (cuts/dissolves only)	32	18	50	50
Preview transitions/effects	yes	yes	yes	yes	yes
Highest audio resolution	16-bit/11-kHz	16-bit/44-kHz	NA†	16-bit/44-kHz	8-bit/44-kHz
Number of audio tracks	4	4	2	3	3
Audio controls	volume, pan	volume, pan	volume	volume, gain	volume, gain
Digital scrubbing	yes	yes	forward, not backward	yes	yes
Bundled software	Media Composer software 4.5	Media Suite Pro software 1.0	TextureSynth, TypeStyler, Video F/X Plus software	Adobe Premiere 2.01, Media Grabber 2.2	Adobe Premiere 2.01, CoSA After Effects, Disk Express II, DQ-Timecoder, Macromedia Director
<b>Configuration</b>					
Mac	Ilci or faster	Ilfx or faster	Ilci or faster	II, Centris, Quadra	Quadra 950
RAM	16 MB	16 MB	16 MB	16+ MB	32 MB
Storage	1-GB hard drive	2-GB hard drive	80 MB minimum	fast drive/disk array	disk array
Displays	Mac RGB display, multi-sync RGB/NTSC monitor	Mac RGB display, multi-sync RGB/NTSC monitor	Mac 8-bit RGB display, NTSC monitor	14" Mac display, NTSC/PAL monitor	14" or 17" Mac display, NTSC monitor
<b>Company</b>					
	Avid Technology, Inc. Metropolitan Technology Pk. One Park W. Tewksbury, MA 01876 800-949-2843 508-640-6789 508-851-0418 (fax)	Avid Technology, Inc. Metropolitan Technology Pk. One Park W. Tewksbury, MA 01876 800-949-2843 508-640-6789 508-851-0418 (fax)	Digital F/X Mountain View, CA 94043 800-955-8273 415-961-2800 415-940-6711 (fax)	RasterOps 2500 Walsh Ave. Santa Clara, CA 95051 800-729-2656 408-562-4200 408-562-4065 (fax)	SuperMac 215 Moffett Park Dr. Sunnyvale, CA 94089 800-334-3005 408-541-6100 408-541-6150 (fax)

\*Version 2.0 of the Media Suite Pro software, now shipping, can export EDLs.

† Depends on attached VTRs.

▶ MacUser Bottom Line pick



**They put a big red crayon** in your hand.

Now what? Aa Bb Cc Dd Ee Ff. Again and again. Is it K or X? May

I go to the bathroom, please? Reececess!

But slowly letters became words, words became sentences, sentences became paragraphs, and paragraphs became a report on  
Gems of the World. C+.

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CIRCLE 120 ON READER SERVICE CARD.

For Your Information.



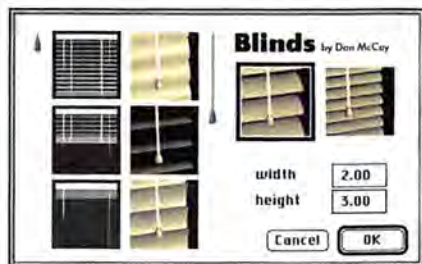


## DESKTOP PUBLISHING

**Child's play:** Composing 3-D scenes can be time-consuming — creating objects, placing them in tableaux, adjusting light sources and shadows — when it could be as easy as arranging a **dollhouse or a diorama**. Pixar's Showplace lets you do just that: You assemble predesigned 3-D

models into scenes, apply textures and effects, and then render them into compositions. Showplace 2.0 is more flexible than its predecessor. It supports DXF (AutoCAD)

models in addition to those in its own RIB (RenderMan) format, and it sports a plug-in interface for creating adjustable models — such as staircases, windows with blinds, and 3-D type — directly within Showplace. You can edit Pixar's Looks library of textures and surfaces with Glimpse, a bundled application that also lets you create new Looks from TIFF or PICT files. 510-236-4000. \$695 (\$495 on CD-ROM). ♦ To add the **illusion of 3-D** without the hassle, try LetterGraphics, a collection of EPS letters from NOVA Cube. Once placed in



your page layout or illustration, these beveled letters can be scaled, skewed, or otherwise transformed. Use-

ful for presentations too, the letters are sold as separate alphabets for \$39.95 each (\$29.95 for up-  
percase only), and you can select from 22 styles in 12 colors with silver or gold beveled edges. To be honest, you can always change colors in your illustration program, and if you work in gray scale, it doesn't matter which color you choose. 800-728-5052 or 302-655-4486.



By Pamela Pfiffner

**Framed:** Adding nice borders to layouts can be an effective design strategy (just ask magazine designer Roger Black), but the borders that come with Aldus PageMaker and QuarkXPress can get pretty boring. Importing clip-art borders is always an alternative, but isn't there an easier way? Funny

you should ask. FRÆMZ Proportional Borders, from ShadeTree Marketing, is a set of **101 borders** for QuarkXPress, where it lives in the XPress Preferences file, or PageMaker, where it's accessible as an Addition. Try bouncing your text off the trampoline frame. 800-678-8848 or 602-279-3713. \$99. ♦ For a different

approach, you should check out BorderFonts, from General Glyphics. This set of 20 border designs loads as fonts, but what makes the designs easier to use than other type ornaments is that frame pieces are found in the same grid of keys, which means you don't have to run all



over the keyboard (with numerous trips to Key Caps) to locate the left corner, for example. Use straight pieces as rules too. 800-854-4061 or 214-350-0952. \$79.

**Express, oh:** Feeling uninspired? What you need is some **spunky dingbats**, such as the Acme collections, from FontHaus. The AcmeAnimals and AcmeServices fonts are digitized versions of Akemi Aoki's cut-paper illustrations. Acme-

Expressions may become the '90s equivalent of the smiley face. Have a nice day. 800-942-9110 or 203-367-1993. \$49 each. ☞





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# Scanning the Globe



*Does canned clip art look too flat?  
For a new dimension in graphics, try scanning  
the objects around you.*

**By Janet Ashford**

**F**latbed scanners, like photocopy machines before them, were designed to scan flat, paper originals. But in offices and studios across the country, it wasn't long before people started playing around by putting objects (including parts of their bodies) on the machines' glass platens to create highly personal images. Compared with photocopiers, where hard-copy output must be pasted into a publication, experimenting with scanners can be especially rewarding, because you can incorporate scanned three-dimensional objects into your publication as illustrations, sometimes even in place of photographs.

Applying colors and special effects in a paint or image-editing program further transforms mundane objects into works of art. Use the scans as color or gray-scale images. Convert scans to line art, posterizations, and duotones, and crop and silhouette them. Combine them with other images, or use them as textural backgrounds or as initial caps.

Why try scanning real-world objects? Compared with using prepackaged clip art, it's available, it's unique, and it's cheap. All it takes is a scanner and some imagination. The possibilities are as endless as the array of objects you find around you.

As the figures that follow show, everyday objects take on new dimensions when they're scanned and enhanced in an image-editing application. A wide variety of materials lend themselves to scanning.

## How to Scan

Scanning three-dimensional objects requires more care than scanning flat art. Follow these tips when putting objects on your scanner:

- Consider the thickness of the object. Your scanner is designed to reflect light from a flat surface, and the parts of thick objects farthest away from the glass will be out of focus. This can result in an interesting effect, but if a sharply focused look is your goal, then be sure to work with thinner items.

- Beefy objects also prevent the scanner lid from closing. This doesn't affect the scan quality per se, but the open lid allows in too much light. The result is a dark background for your object. You can remove the background in an image-editing application, or you can construct a temporary lid by setting a piece of white cardboard raised on shims on the platen.

- Three-dimensional objects cast shadows, but the shadows that result from the scanner's light source as it moves up the glass are not the same as those cast by a directional light. To get more-realistic-looking shadows, add them in an image-editing application. Two programs, Studio/32, from Electronic Arts, and PixelPaint Professional, now sold by Pixel Resources after a stint with SuperMac Technology, offer automatic drop-shadow functions, mainly for use with type, but the results are solid-toned and fairly harsh. Adobe Photoshop's masking functions create softer-looking shadows.

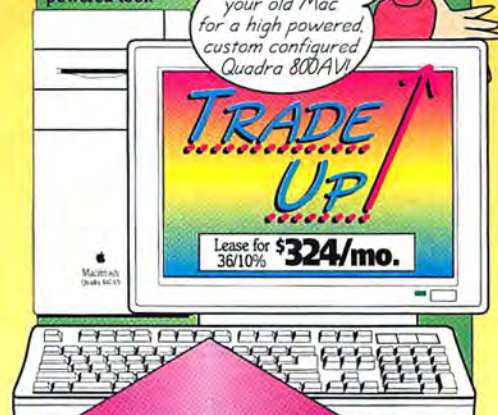


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## DESKTOP PUBLISHING

### GRAPHICS

• Keeping spherical or cylindrical objects stationary on the scanner glass can be challenging. To prevent items from rolling off the scanner bed, place small strips of art board around the edges. You can incorporate this frame into your design or edit it out later in an image-editing application.

• Even if you're planning to use the

image in gray scale, scanning it in full color and then converting it may be a good idea. The method used for converting color to gray scale in an image-editing program such as Adobe Photoshop may be better than that built in to your scanner.

• Don't forget the oft-repeated scanning-resolution formula. To keep the file



a



b



c



d



e

### Theme and Variations

Plant materials are especially good subjects for scanning, because they tend to be thin and have wonderful variety and texture. After scanning some silk flowers at 266 dpi, I opened the file in Adobe Photoshop and boosted the color saturation and the contrast to about 25 percent, to deepen the color (a).

For a line-art variation (b), I converted a detail of the flower scan to gray scale and then applied the Photocopy filter from Aldus Gallery Effects, Volume 2.

For a different effect, try Photoshop's posterization controls, which convert gray-scale or brightness values to a specified number, remapping the pixels to the closest set value. For example, when you set Posterize (under Map, on the Image menu) to four levels and apply it to a 256-level gray-scale image, it produces black, white, and two shades of gray (c). But a three-level Posterize applied to a color image results in more colors than the specified number (d), because colors of different hues can have the same saturation and thus the same gray-scale value. Another option is to add color to the posterized gray-scale flower: I

painted out unwanted background with white, converted the image to RGB mode, and used the Levels command (under Adjust, on the Image menu) to add purple (e).

To create a PostScript version of the image to be used in a greeting card (f), I first softened the gray-scale posterization by applying Photoshop's Blur filter several times and painting out some of the smaller details to reduce the number of control points. I then auto-traced it in Adobe Streamline and colorized it in Aldus FreeHand.



f



size of your scanned-image manageable, scan the object at a resolution 1.5 to 2 times the anticipated printed line screen, which is typically 133 to 150 lines per inch for magazine work, and scan at the actual size at which the image will be used. (If you scan a 2-inch object at 266 dpi and then enlarge it to 4 inches in a page layout, the effective resolution will

drop to 133 dpi). For example, *MacUser* is printed at 133 lines per inch, so we scanned the objects at a resolution of 266 dpi at 100-percent size. To resize some of the larger images to their anticipated final size, we used Adobe Photoshop's Image dialog box to change the image size without changing the resolution.

• Last but not least, remember that



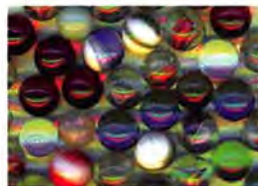
a



b

#### From Popcorn to Stucco

Scanned foods make interesting stand-alone illustrations and background textures, but you have to be careful. I placed yellow popped corn on the scanner glass; scanned it (a); and then opened the scan in PixelPaint Professional, where I applied the Emboss filter with the foreground color set to a yellowish beige. This filter applies a raised, three-dimensional look, which in this case produced a texture similar to rough plaster (b).



a



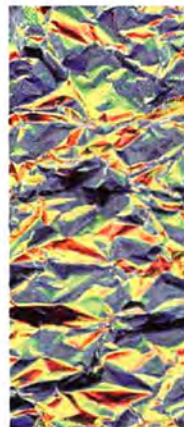
b



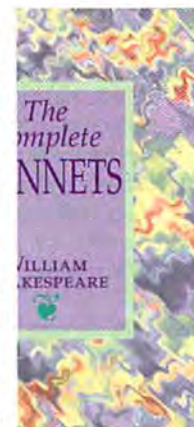
c

#### From Marbles to Hexagons

I opened a scan of marbles (a) in Photoshop and applied Find Edges (under Stylize, on the Filter menu), which traced the edges of the marbles with light colors and turned the light background dark (b). (Applying Find Edges in Photoshop 2.5 results in dark outlines on a light background.) In Fractal Design's ColorStudio, I used the Pixelate filter (under Set Filter, on the Effects menu), set to Hexagon mode, with Hexagon Half Height set to 26 (c).



a



b

#### Creating a Marbled Texture

Textured papers produce elegant patterns when scanned, but surprisingly good results come from household materials such as crumpled aluminum foil. Its shiny surface reflects the scanners' red, green, and blue light sources, resulting in a bright, hard-edged pattern of the three colors plus black and white (a). For a marbled effect, I first decreased the contrast to make the colors more pastel and then twice applied Photoshop's Ripple filter (under Distort, on the Image menu). I cropped the image to its upper right quadrant, saved it as a TIFF, and then imported it into FreeHand to create a traditional book cover (b).

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**CIRCLE 24 ON READER SERVICE CARD.**

## DESKTOP PUBLISHING GRAPHICS

when you scan real-world objects, clean-up involves more than just touching up the image. Depending on what you're scanning, it also means literally cleaning up the scanner. Scanners weren't designed for liquids or other products that

can damage sensitive electronic circuitry, so scan at your own risk. 

Regular *MacUser* contributor Janet Ashford is coauthor of the upcoming book *Aldus PageMaker: A Visual Guide for the Mac*.

### Creating an Initial Cap

You've probably seen books or posters of "found alphabets" — things such as tools, artists' supplies, natural objects, even the patterns on butterflies' wings — that follow the shapes of letters of the alphabet. Scans of such objects can make effective initial caps for an article that lacks other illustration, especially if the objects tie in to the subject matter.

Another idea is to mask a scan of objects into a letter shape. To make a decorative initial



a



b

cap for a matchbox design, for example, I scanned kitchen matches and opened the scan in Photoshop, where I increased the canvas size and rotated it to a horizontal format (a). I imported the scan into FreeHand, where I typed an *M* in Helvetica Black, stretched it to fit over the scan, converted it to outlines, and then pasted the scan into the letterform. Additional type and a background completed the matchbox design (b).



### Found Mandalas

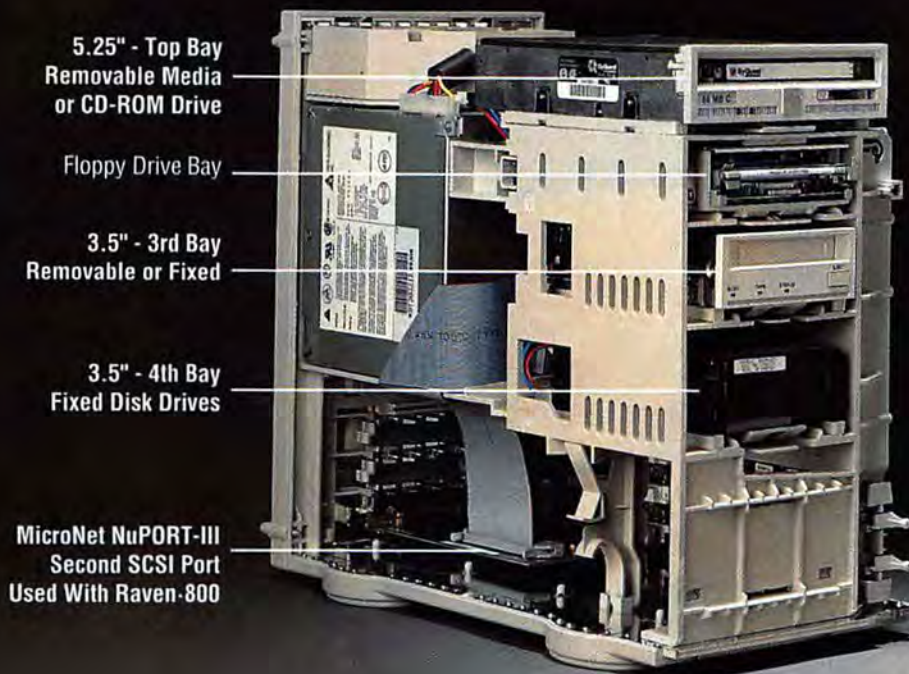
Photoshop filters can transform scans of everyday objects into something much more interesting, such as these mandalas. The result is a striking example of the interplay between art and life. Mandalas are symbols of wholeness and are used as focal points for meditation in the East; they also occur frequently in nature and in the ornamentation of everyday objects around the world. I looked around the house for examples of mandalas — circular designs that are divided, usually, into four (or sometimes three, six, or eight) segments. I unearthed the following (top row, from left to right): an acorn squash, a pinecone, a doll's Mexican hat, and a basket lid.

After scanning and cropping these, I transformed each raw scan into an illustration by applying filters from Aldus Gallery Effects: Classic Art, Volume 2. I used the following filters (bottom row): Accented Edges (acorn squash), Notepaper (pinecone, with the foreground and background colors set to red and purple), Stamp (Mexican hat, with the white areas filled with color), and Bas Relief (basket lid, with the foreground color set to purple).



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**CIRCLE 114 ON READER SERVICE CARD.**







1

3

2

6

4

5

7



It's a wild world, and here's how it was created. Original pencil sketch of the Mandrill is scanned for use as a template.

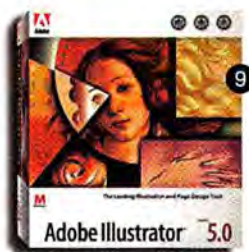
① Sketch is now traced with Pen tool. ② Two shapes that compose ear are constructed with Divide Fill tool. Mane is built with three tools: ③ Star filter creates a basic jagged shape; ④ Scribble filter randomizes star points; and ⑤ Twirl filter alters star point angles. ⑥ To create eyes, three colors are selected and placed in circular gradient. ⑦ Multicolor gradient generates this medley of tones with less banding. ⑧ Pathfinder tool is used in headline to isolate and create shapes occurring where areas intersect, permitting them to be colored separately. ⑨ Clicking on placed images can automatically launch Adobe Photoshop™ and its powerful tools. Paint Style Box (not shown) allows quick and easy selection of commonly used colors. This entire ad was created in Adobe Illustrator 5.0. Illustration by Ron Chan.

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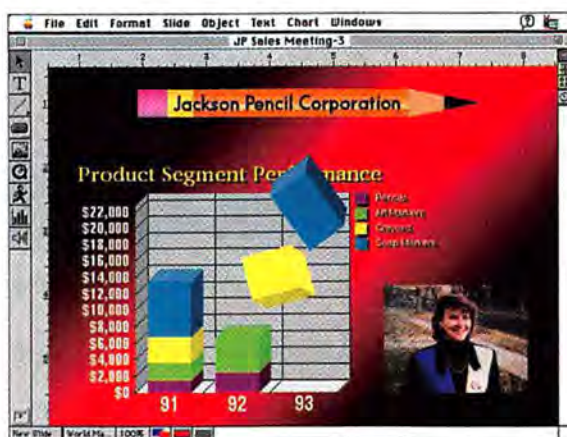
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# Cool Packaging in a Hurry

*Creating innovative packaging is fast and easy when you use digital tools such as Adobe Photoshop, Aldus FreeHand, QuarkXPress, and a Leaf Systems digital camera.*

**By Janet Ashford**

It's smart to use digital design tools to produce packaging for digital design tools. Not only does the work go faster but also the medium truly becomes the message. Such was the case for packaging created by Imprimatur Designs for a set of seven Scitex XTensions, tools that aid design and production with QuarkXPress. Scitex America asked the company, based in Cambridge, Massachusetts, for a turnaround of just seven weeks, so Imprimatur decided to design the packaging by using the products themselves along with other state-of-the-art hardware and software.

Michael J. Sullivan, founder and creative director of Imprimatur (now Haywood & Sullivan), designed the package—a colorful envelope that could be folded into a desktop disk holder. The package designs and type were produced in Aldus FreeHand and incorporated photo montages created by Schlowsky Photography, of Weston, Massachusetts. Bob Schlowsky used a Leaf Systems digital camera to record still-life shots directly to disk. While the photo shoot was still in session, Lois Schlowsky edited the images with Adobe Photoshop on a Quadra 900 and with HiRes QFX on a 486

PC, exchanging files in Targa format. Sullivan and the Schlowskys worked together during the shoot and got the images they needed into digital format in three days, instead of the seven to ten days required in a conventional photo shoot with film processing and image scanning.

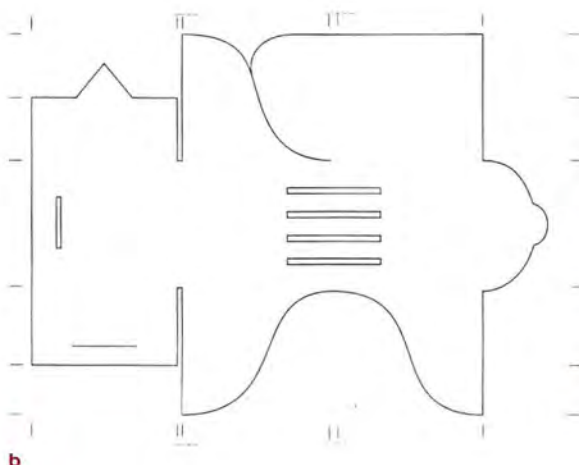
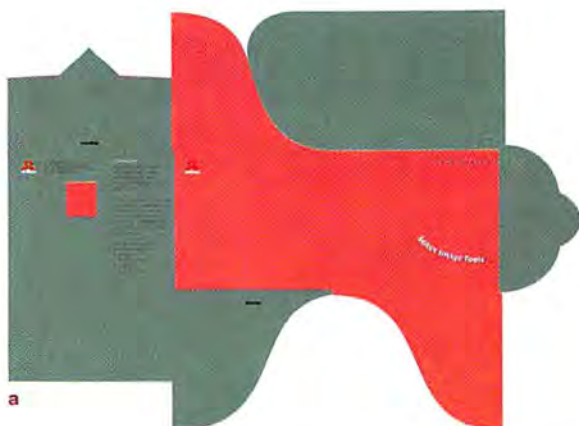
While Lois Schlowsky continued to refine the photo montages, the team at Imprimatur worked in Aldus FreeHand to complete the package designs, create disk labels, design covers for the manuals, and draw instructions for folding the package into a disk holder. They used QuarkXPress to lay out the 52-page manuals, using some of the Scitex XTensions, including Grids & Guides, Fractions, Image Tools, and Document Reports. Color files were proofed on an Iris inkjet printer, and final color-separated film was output through a Scitex Dolev imagesetter. Having started on October 21, the team finished the packages by January 4, proving that talented artists and designers using digital technology can create sophisticated products in a hurry.

Janet Ashford is coauthor of *Aldus PageMaker: A Visual Guide for the Mac*.



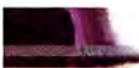
Imprimatur's design for the Scitex XTensions packaging incorporates an origami paper-folding approach. Printed on card-weight paper, the packages have top and bottom flaps that fold down to form sleeves that hold the disk and manual inside. Slots and cutouts make it possible to fold and stack the packages into a disk caddy. The small package size (about 5 x 5 1/2 inches), folding construction, and use of recycled paper (Federal Mill's Envirocote for the cover and St. Laurence's 60# Multifect recycled for text stock) were intended to minimize environmental impact. The photo montages were created by Bob and Lois Schlowsky, who used a digital camera and digital image editing.





## 1 Designing the Package

Michael J. Sullivan sketches out a packaging concept that includes sections for holding a manual, a floppy disk, and a registration card. After approval by Scitex, Sullivan and colleague Mark Field render the final package design in FreeHand (a). For type, they use Gill Sans and Esprit in black and white on solid backgrounds, choosing a different Pantone color for each package (in this case, it's PMS 556). A curved shape, shown here in pink, serves as a path for clipping the imported photo-montage TIFF. The designers also use FreeHand to create a die-cut guide that indicates the position and shape of the main flaps, slots, and cutouts (b). The guide is given to the printer, along with color-separated film.



## 2 Creating Photo Montages

Sullivan brainstorms with the Schlowskys about the photographic approach he wants to take, focusing on still-life elements that relate to the purpose of each Scitex XTension. Some images originate as 35mm slides that are scanned on a LeafScan 45 film scanner. Others are purely digital: During a one-day shoot, Bob Schlowsky uses a Leaf Systems digital camera connected to a Mac to record the images directly to a hard disk. The images are immediately viewed on-screen and edited by Lois Schlowsky and Sullivan, providing instant feedback for the photographer.

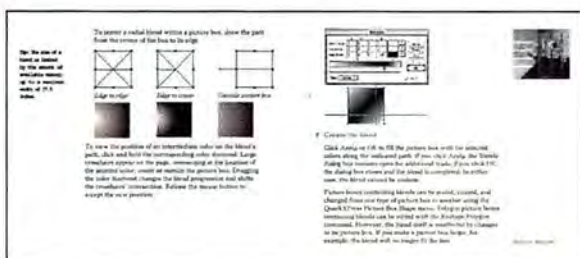




a



b



### 3 Adapting the Montage

To ensure visual cohesion, the same images created for the external packaging appear on the accompanying manuals. For the Image Tools manual, for example, the package-cover image is imported twice into the FreeHand layout and pasted into curved shapes on the front and back, shown here in pink (a), so that the rest of the image is masked off. The manual cover repeats the curves and the four slot elements of the package cover, but here the slot shapes are filled with gradations in tints of the package color (b).

### 4 Designing the Manuals

The software manuals, which fit inside the packages, are designed in QuarkXPress, and some of the Scitex XTensions they describe are used. This spread from the Scitex Image Tools manual demonstrates how blends are created with the XTension's Blends tool.

### 5 Drawing an Instruction Sheet

Explaining how to put together this origami-like design is challenging, so Sullivan and Field again turn to FreeHand to create a diagram that shows how to fold a single package into a disk holder and how to stack and fold several packages together. Created in black-and-white, the diagram is printed across the inside of the manual cover.

### 6 Finishing the Project

The finished photo montages are saved in Photoshop as EPS files in DCS (desktop color separation) format. This approach separates each image into four-color, CMYK layers, producing four separate color-separation documents plus a PICT screen-image document for each file. The photo montages are proofed on a Kodak XL7700, and Iris proofs are used for the FreeHand documents. The QuarkXPress files are trapped and then color-separated to film on a Scitex Dolev imagesetter, and Matchprints are used for final color proofs before printing.



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**Desktop printing:** Sonic Systems' new Print Juggler is the evolutionary link between printing as we know it and QuickDraw GX. With this \$49 software installed on your Mac, you can create desktop icons for printers that display whether a printer is busy, so you can **scope out a free printer** before you drag 'n print. 408-736-1900.



busy



can't find



paper problem

**Breaking the print barrier:** Moving up to Ethernet doesn't mean you have to say goodbye to your old printers and other LocalTalk devices. Compatible Systems (303-444-9532) recently upgraded the still-\$695 Ether•Write, its Ethernet-to-LocalTalk converter, to version 2.0. The new hardware lets you connect as many as six LocalTalk de-

vices to an Ethernet network via 10BASE-T, thicknet, or thinnet wiring. Plus: flash-upgradable firmware and management software that gives you detailed bandwidth statistics. ✕ Printing from token ring instead? Check out Dayna's new LocalTalk-to-token-ring converters: TokenPrint (two devices max., \$699)

and TokenPrint Plus (as many as four devices, \$899). Each allows password-protected access to the LocalTalk devices. 801-269-7200. ✕ To make that **network-to-network leap** without buying another piece of hardware, try Sonic Systems' Ethernet- or token-ring-to-LocalTalk software, recently upgraded to version 3.0 (\$49 upgrade fee). The major new features are password-protected access to LocalTalk devices and support for TCP/IP services. LaserBridge (\$199) supports as many as ten LocalTalk printers, PowerBridge (\$149, or

\$249 with TCP/IP) connects one LocalTalk device of any kind, and SuperBridge (\$249, or \$349 with TCP/IP) allows as many as ten LocalTalk devices to connect to an EtherTalk or TokenTalk network.

**Maximum modem moxie:** Face it, most Macs have wimpy serial hardware — their tiny serial-port buffers just weren't made to handle the volume of incoming data that a high-speed modem can deliver. Fortunately, version 1.5 of the Apple Modem Tool (used by the Macintosh Communications Toolbox) provides a fix for this problem: software MNP. This error-correction software is able to **deal with mangled data** as it arrives — so it makes sense to have it in your Mac, where it can guard against serial-port data loss. The new Apple Modem Tool will be available free, most likely through on-line services. ✕ While you're beefing up your Communications Toolbox, how

'bout some **fast-file-transfer** tools to support Zmodem, X/Ymodem, and Kermit? You can get a basic set of three tools supporting these protocols for \$69.95 from Sequest Software (503-531-0252) or buy extra-fast versions (reportedly) from Aladdin Systems (408-761-6200) as part of SITcomm, the company's new \$120 communications package.

**Caffeinated routing:** So you want a faster Fast-Path? Version 9.2 of Shiva's K-STAR management software (\$199) includes TunnelTalk (the former **Dr. Pepper**, for those who follow code names), an alternative to Apple's AURP, for routing AppleTalk through TCP/IP with minimal traffic overhead. K-STAR 9.2 also provides improved device monitoring and SNMP management, zone and device filtering, and more. 617-270-8300. 🖨



By Stephan Somogyi





OR



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Step 2: Notice how incredibly easy Now Up-to-Date is to use. Totally customizable. 100% non-fascist. Just click on a date, enter your info, bang, you're done.

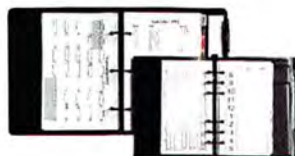
Step 3: Think to yourself, "Wow, calendar software that's actually faster and easier than the old pen and appointment book approach. Amazing."



Step 4: If you are on a network, share events from



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*Calendars can be printed in all major appointment book sizes and formats, in a wide variety of views and styles. You can even print out wall charts.*

your calendar with the other folks on your network. In return, they'll no doubt share meeting dates and whatnot with you. Not on a network? No sweat, Now Up-to-Date still works fine all by itself.

Step 5: Fly to Zimbabwe and bring up your calendar on your PowerBook. Good. Now change everything. Perfect. Now connect to your office via modem. Presto! All your calendars automatically update themselves.

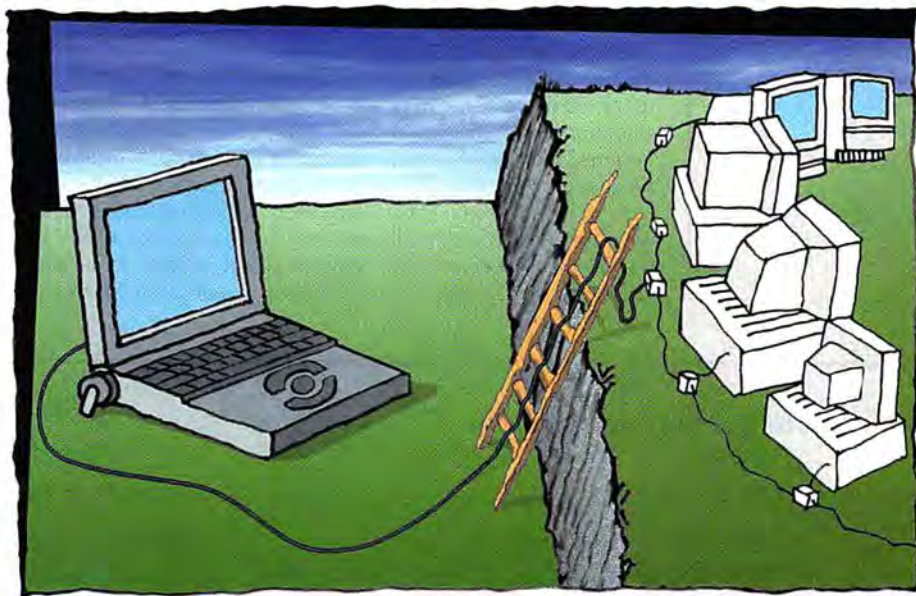
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**Now  
Software**



# Ethernet for PowerBooks



*Your office is on Ethernet, but your work's on a PowerBook.  
Can a SCSI Ethernet adapter give you the speedy,  
no-hassle network connection you need?*

**By Kelli Wiseth**

Only one obstacle is keeping you from using your PowerBook all the time: It has no built-in Ethernet capability.

If you had a PowerBook Duo, you could add an Ethernet card to your Duo Dock or get a dock with built-in Ethernet capability, such as E-Machines' portable EtherDock. But you don't have a Duo. And your office has evolved beyond LocalTalk, the only type of network your PowerBook is built to access (because Apple didn't include its handy AUI Ethernet connector, as it did in the Quadra and recent printers). So, much as you love your PowerBook and hate transferring work to and synchronizing files with your desktop machine, you're stuck in the two-machine trap if you want to connect to the network at work. And if you're a mobile network manager wanting to connect your PowerBook to lots of Ethernet networks, you're stuck lusting after the PCMCIA Ethernet cards some of your PC counterparts are toting around with their laptops.

But wait — there *is* an alternative, the same one available to slotless desktop Macs such as the Classic: a SCSI Ethernet adapter, which is a small hardware device that directs Ethernet packets into and out of the PowerBook through the SCSI port. It doesn't provide throughput as fast as you'd get from a NuBus or PDS (processor-direct slot) Ethernet card — understandably, because the SCSI bus wasn't designed to handle network traffic — and it's not as easy to carry as a PCMCIA

card, but it's faster than any alternative PowerBook network connection, such as going through an Ethernet-to-LocalTalk converter or router.

To help you decide which PowerBook SCSI Ethernet adapter best meets your needs, we looked at the data-transfer speed, convenience, and portability of the 10BASE-T versions of eight such products: the Asanté EN/SC-PB, Asanté Mini EN/SC-T, Cabletron EA412, Compatible Ether+, Dayna DaynaPORT SCSI/Link-T PB, Farallon EtherMac SCSI/PB 10BASE-T, Focus EtherLAN SC-T, and Technology Works (TechWorks) Ethernet SC-T. Some of these products are versions of others (Dayna licenses its design to Farallon, and Compatible Systems licenses its design to Focus Enhancements and Technology Works), but you will still find differences among these products in terms of pricing, support, and included cables and connectors.

## Speed Similarities

As Figure 1 shows, data-transfer speed isn't a major differentiating factor among these products — this is not too surprising, given that many of the products are licensed from competing companies or use the same Ethernet controller. We copied files and folders of various sizes between a PowerBook 180 and a Quadra 950 and measured how long it took each product to transfer packets between the server and the PowerBook. With the exception of the Cabletron EA412,



### At a Glance

▶ Asanté Mini EN/SC-T	🚗🚗🚗 1/2
▶ DaynaPORT SCSI/Link-T PB	🚗🚗🚗
▶ Farallon EtherMac SCSI/PB	🚗🚗🚗
10BASE-T	🚗🚗🚗
Asanté EN/SC-PB	🚗🚗🚗
Cabletron EA412	🚗🚗🚗 1/2
Compatible Ether+	🚗🚗🚗
Focus EtherLAN SC-T	🚗🚗🚗
TechWorks Ethernet SC-T	🚗🚗🚗
▶ MacUser Bottom Line pick	

which transferred data more slowly than the other products (most notably when reading a 5-megabyte file, which took twice as long), times for these products were close. Asanté's products were generally the fastest at transferring data, most likely because of Asanté's custom-designed SCSI interface — it's optimized to reduce much of the overhead that results from the SCSI specification being designed for mass-storage devices rather than for network use.

Even the Cabletron EA412, however, was much faster than the alternatives we tested — it took about half as long overall as copying the files via an Ethernet-

to-LocalTalk converter or router. In other words, if you want to connect your PowerBook to an Ethernet network, using a SCSI Ethernet adapter is the speediest way to go.

### Daisy-Chain Dilemmas

Of course, if you've spent time connecting SCSI devices, you may be less worried about speed than about another notorious aspect of SCSI: daisy-chaining. How easily can these products coexist on a SCSI chain with other devices such as an external hard drive or a CD-ROM drive? And does the PowerBook's unusual SCSI port (HDI-30 instead of



Figure 1: Comparing Copy Speed

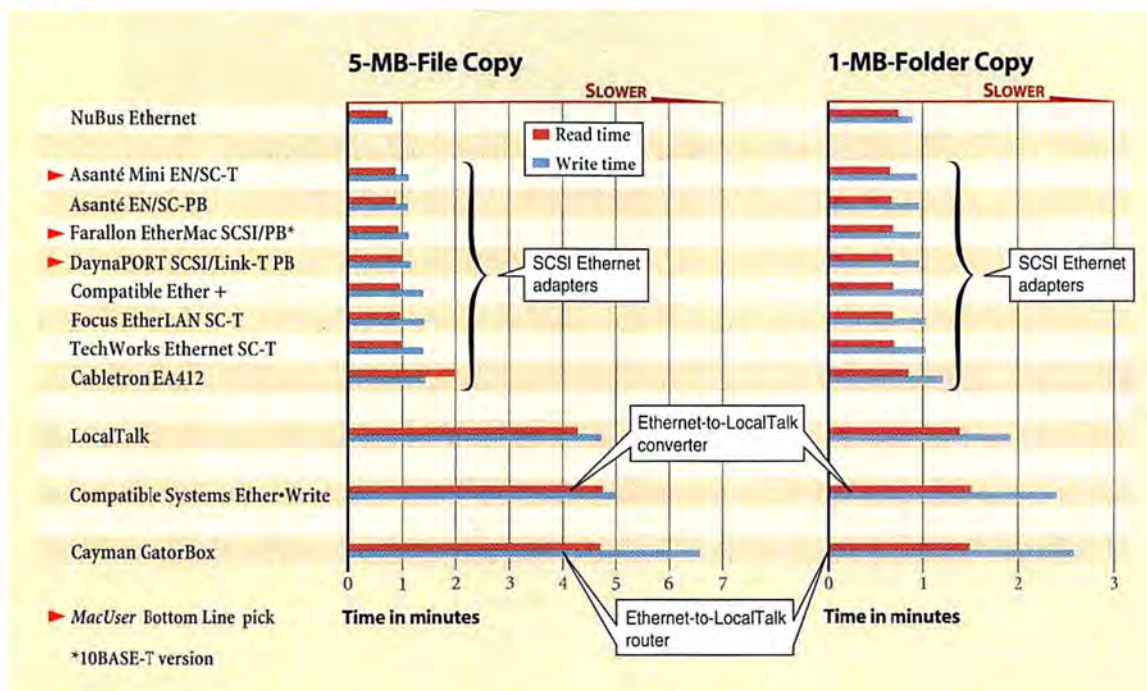


Figure 1: Slower than a NuBus Ethernet card but faster than any viable alternative for hooking your PowerBook to Ethernet — that's the word on SCSI Ethernet adapters, which route packets into the PowerBook via the SCSI bus.

ZD Labs' test network consisted of a Quadra 950 server running AppleShare 3.01, connected via an Asanté FriendlyNet adapter to an Asanté hub; we connected a PowerBook 180 to the hub by using the SCSI adapter being tested. To show optimal throughput unimpeded by the overhead associated with keeping track of many filenames, we copied a single 5-megabyte Photoshop file between the server and the PowerBook. To show the

effect of significant filename overhead, we then copied a 1-megabyte folder containing hundreds of files.

In all four of the processes we timed — read and write times for the 5-megabyte file and the 1-megabyte folder — we saw close results for all the adapters except Cabletron's. Still, with the adapters, the processes didn't take much longer than with a NuBus Ethernet card (in the 1-megabyte read test, with most of the adapters, they took even slightly less time!), and the adapters gave much better times than those we saw when we left the PowerBooks on LocalTalk and connected to the Ethernet network via a router or an Ethernet-to-LocalTalk converter.



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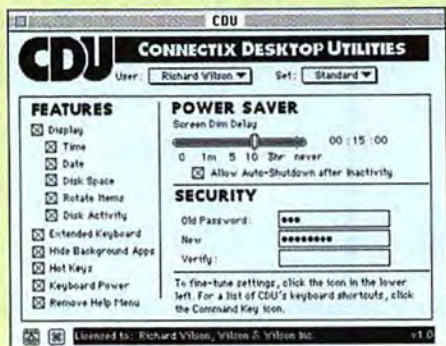
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## BRIDGES MOBILE CONNECTIVITY



**Figure 2:** Asanté not only includes both types of SCSI cables (for regular Macs and for PowerBooks) with its Mini EN/SC-T, but it also provides two DB-25 connectors on the non-PowerBook end of its PowerBook SCSI cable. This cable allows the Mini EN/SC-T, which has only one SCSI port, to be the first device in your PowerBook's SCSI chain and to have a second device daisy-chained to it.

DB-25) present any extra cabling hassles?

The Dayna and Farallon products are configured to provide you with optimal SCSI flexibility. These devices have two SCSI ports apiece and allow you to enable and disable termination easily with external switches, so you can fit them anywhere in the SCSI chain without much problem. Asanté's EN/SC-PB, the predecessor to the company's lightweight Mini EN/SC-T, also has two SCSI ports, along with an auto-terminating feature that figures out whether termination should be applied; however, this feature doesn't work with the PowerBook, so you need to put the device either at the beginning or the end of a PowerBook's SCSI chain.

In the less-flexible-but-even-more-ingenuous category are the Asanté Mini EN/SC-T and the Cabletron EA412; each is a single-SCSI-port adapter, but the companies offer a cable/adaptor that gives you an extra port (and that lets you choose whether you want the extra weight). Asanté's HDI-30-to-DB-25/DB-25 cable (see Figure 2), which ships with the Mini EN/SC-T, lets you put the SCSI Ethernet adapter first in your chain and daisy-

chain a second device from it; a switch lets you enable or disable termination. Cabletron's extra-port adapter is a block containing three SCSI ports that mounts on the EA412, so one of the three SCSI ports connects to the PowerBook, leaving you two — unfortunately, you have to pay \$45 extra for it. You can enable or disable termination easily with this product also, by selecting from two sets of SCSI-ID numbers (one for terminating, one for unterminating).

Least flexible are the Compatible Ether+, Focus EtherLAN SC-T, and TechWorks Ethernet SC-T. Each one is internally terminated and cannot be unterminated, so it must either be the last device in the chain or the only device. If your SCSI chain already contains another such device — one with a single SCSI port, forever terminated — you won't be able to add one of these adapters to your SCSI chain.

Compatible and Focus are also among the least obliging vendors — along with Cabletron — as far as providing the appropriate SCSI cables. You need to order the PowerBook SCSI cable separately from these vendors, for about \$25



## Tips for Ethernet on the Go

Whether you're traveling from network to network with your PowerBook or just leaving your adapter on your desk so you can connect whenever you're there, these tips will help you keep your SCSI Ethernet connection hassle-free:

➤ **Don't connect without warning.** Get clearance from the network administrator before adding your PowerBook as a new node on any Ethernet network. Knowing that you're on the network will help your administrator troubleshoot any potential problems.

➤ **Power down all SCSI devices.** Before adding a SCSI Ethernet adapter to your PowerBook's SCSI chain, removing the adapter from the chain, or changing any SCSI-ID numbers, make sure the adapter is off. Power to all other devices in the chain — hard drives, CD-ROM drives, and so on — should also be off.

➤ **Turn on the SCSI Ethernet adapter first.** Before turning on your PowerBook, be sure to turn on the SCSI Ethernet adapter first. When the PowerBook starts up, the SCSI Manager looks to see what's connected on the SCSI bus. If the PowerBook is turned on first, it may not see the SCSI adapter.

➤ **Check your connection.** Use the diagnostic software that comes with your adapter to check the integrity of the network connection and of the hardware itself before harassing your network administrator about not being able to connect.

➤ **Let sleeping PowerBooks lie.** Before making any changes to the SCSI connection, don't just put your PowerBook to sleep — shut it down. When the PowerBook is in Sleep mode, it still draws a minimal amount of power. Disrupting a sleeping PowerBook's SCSI bus — by yanking it from its SCSI Ethernet adapter to run to a meeting, for example — can cause problems: When you reconnect and wake up the PowerBook, shared disks may not auto-remount when they should or your PowerBook may hang.

➤ **Carry the diagnostic software with you.** Even if you hate statistics, consider copying the diagnostics and any other troubleshooting software that comes with the adapter into a folder on your PowerBook's hard disk. Then if you have a problem when you're connected at another site, at least you'll have some troubleshooting tools besides the LEDs.

from Compatible and Focus and \$45 from Cabletron. In contrast, the other vendors provide the PowerBook cable free if you specify you want the PowerBook version of the product. Only Asanté goes even further, providing PowerBook as well as regular Mac cables with its Mini EN/SC-T.

### Portability a Plus

In addition to speed and SCSI issues, we looked at how portable these products are. If you're going to keep the adapter on your desk and use it just to connect to the office network, portability may not matter to you. However, network administrators and other folks who tramp from site to site with PowerBook in tow need an adapter that weighs little and fits easily into a purse or a pocket.

For portability, the Asanté Mini EN/SC-T is the best choice. It has the smallest footprint — just slightly larger than a cassette case — and weighs the least overall: The adapter, the power supply, and the SCSI cable weigh about 1.5 pounds. The least portable products are those from Compatible, Focus, and

TechWorks; at 3.5 pounds apiece, each is fully 2 pounds more than the Asanté Mini EN/SC-T.

### Lots of Connections

If you're going to be traveling to a variety of sites and want to be ready for any type of Ethernet cabling, you should get an adapter with connectors for all three common types — UTP (unshielded twisted pair), thinnet, and thicknet — or at least for UTP and thinnet cable.

Because we tested the 10BASE-T versions of these products, each of the adapters we looked at had at least one RJ-45 connector (for UTP); some also had a BNC connector (for thinnet) or an AUI connector (for an external transceiver for thicknet). With the exception of Farallon, all the vendors offer multiconnector versions of their adapters. However, only Asanté and Dayna provide all three types of connectors on one device — Asanté with its EN/SC-PB and Dayna with a three-connector version of its adapter that costs the same as Asanté's (\$499).

Having more than one connector on-board isn't enough, though; you should also be able to select the appropriate



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In the past ten years, there's been a lot of evolution since the Macintosh revolution. This special feature looks back on the history of the Macintosh, and looks forward to the PowerPC, including an overview of what it is, where it's going, and what it will mean to you. The best is yet to come in MacUser.

## FILE COMPRESSION COMPARED

Interest in automatic file compression is expanding among buyers — but what are the hidden dangers? Will it negatively effect computer performance? The MacUser experts evaluate eight products to deliver the answers you need to know.

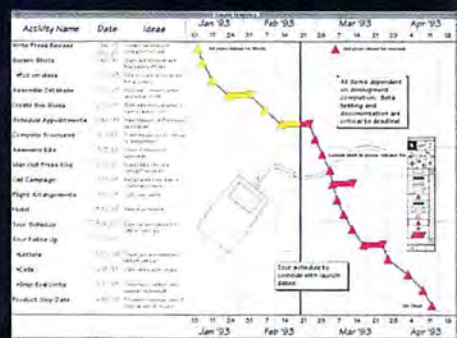
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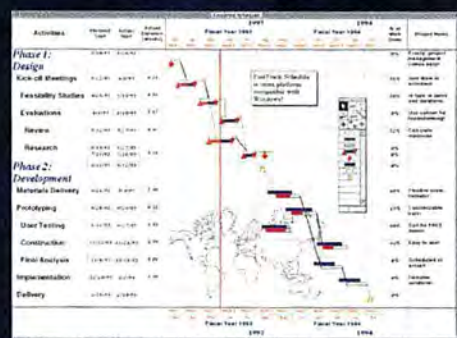
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## BRIDGES MOBILE CONNECTIVITY

connector with a mouse click or the flip of a switch. Better still, do nothing and get an adapter that *auto-senses* which connector has a cable attached.

The multiconnector version of the Cabletron EA412 automatically selects the connector that has a cable attached, but you can also disable this auto-sense feature by selecting a connector through a cable-type control panel — so you can leave two networks connected to your PowerBook and easily switch between them. The Asanté Mini EN/SC-T and the Dayna multiconnector adapter are also auto-sensing but don't have the override ability. The Asanté EN/SC-PB's external switch lets you easily switch from one cable type to another.

Least convenient is the selection scheme used in the Compatible, Focus, and TechWorks adapters, which are set at the factory for the type of Ethernet you specify. To change the cable type, you have to open the adapter, locate the jumper pins, and use needle-nose pliers to remove the jumper. This isn't impossible, but it's far from convenient.

Finally, keep in mind that many large

networks were installed prior to the final 10BASE-T specification and may not support the link-integrity feature of the final spec. Check with your network administrator about this; if your network doesn't support link integrity, it won't know how to respond to the packets the adapter sends out to test the integrity of its link to the network. The Asanté Mini EN/SC-T is the only adapter that lets you disable link integrity and avoid flooding a pre-10BASE-T network with packets it doesn't know how to handle.

### Drivin' Software

Once you've made all the physical connections — you simply select the appropriate SCSI ID and connect the adapter to your PowerBook (via the SCSI cable) and the network (via the appropriate connector) — there's still one more step: You need to install the driver software, which replaces a small piece of the AppleTalk stack so that traffic can be routed through the SCSI port.

Installing the driver is easy: Just boot your PowerBook from the installation floppy disk, and click on OK in each

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Keyboard

management

Monitors

Control Panel

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PCName: Accounting Dept  
Location: San Francisco Office, 3rd Floor  
Owner: Raymond and Ali Martinez  
Comment: Alternate location: Beach Office  
MMAC Add: 00-00-00-00-00-00  
MMAC Port: 00 MMAC Board: 0  
IP Add: 0.0.0.0

Cabletron SYSTEMS INC

3.3.3

Save

Figure 3: We found Cabletron's software the most useful overall. The diagnostic software is easy for users to comprehend, and the management software is especially informative. Cabletron's was the only one of the adapters we tested that includes an SNMP control panel. It allows network administrators to access information on the adapter-connected PowerBook from any SNMP-compliant network-management package.



dialog box until the process completes — a matter of a few minutes. Then open the Network control panel and select the EtherTalk Alternate icon to choose the Ethernet network.

After installation is complete, it's a good idea to run through the vendor's diagnostics program before attempting to use any network services, such as AppleShare servers. The diagnostic software confirms that the adapter hardware itself is good and also checks the integrity of the network connection.

All the vendors of the products reviewed here provide some level of diagnostics. Compatible, Focus, and TechWorks — each of which use Compatible's Manager+ software with the company's own name on it — provide a good deal of information, such as SCSI and network-related error statistics. The Dayna and Farallon packages have pass/fail tests for the hardware and software and a test for the network connection. Asanté's Troubleshooter software has a single easy-to-understand dialog box providing access to five tests, with pass/fail information about hardware components and network connections in simple language; it also lets network administrators gather network-activity statistics.

Cabletron stands out, however, in its complete package of diagnostics, control panels, and extensions for users; it also includes SNMP (Simple Network Management Protocol) management for network administrators. The diagnostic utility displays information in a straightforward fashion, and you can use one screen to check all components and the network connection. In addition to providing diagnostics, Cabletron gives users an extension that displays network-activity statistics as well as a control panel for overriding the auto-sense cable-selection feature.

For network administrators, Cabletron's SNMP control panel (see Figure 3) enables long-distance troubleshooting through any SNMP-compliant management software, including Cabletron's Remote LANView, a Windows-based application. You set up information about your PowerBook in the Management control panel; the administrator, using an SNMP-compliant management program, can then see this node from elsewhere on the network. If you're managing a large, multiplatform network, being able to identify the name and location of a problem workstation is a boon.

### Adapter Advice

If you want Ethernet connectivity for your PowerBook, you'll need a SCSI adapter. The question is, which one?

If you want portability, the Asanté Mini EN/SC-T is your best choice. This 6-ounce adapter is about the size of a cassette box and is just as portable. It has a BNC connector for thinnet and an RJ-45 connector for UTP Ethernet connections, and it automatically chooses the appropriate one when you plug in the cable. Although the Mini EN/SC-T has just one SCSI port, Asanté's clever cable lets you daisy-chain a second SCSI device. The Mini EN/SC-T also provided the best data transfer in our tests, and it's the only adapter we looked at that lets you disable link integrity to avoid creating traffic problems on old, pre-10BASE-T UTP networks.

If portability is less important to you than the convenience of having an adapter that can fit anywhere in a SCSI chain, go with one from Dayna or Farallon. The DaynaPORT SCSI/Link-T PB is flexible in its network adaptability as well as in its SCSI-chain placement; it's available in a three-connector model (for UTP, thinnet, and thicknet) that costs no more than the other three-connector adapter, the Asanté EN/SC-PB. The Farallon EtherMac SCSI/PB 10BASE-T is available with only one connector (for UTP or thinnet), but it comes with Farallon's outstanding lifetime warranty and has the second-lowest price of all the adapters we looked at.

Finally, look for competition to drive adapter sizes and weights down and to drive prices down as well. At press time, Dayna was planning to introduce a more portable adapter sometime around November, and MacNet (408-954-8888) had just entered the competition with a \$329 adapter, less expensive than all but the Focus adapter in this roundup.

Of course, we hope that competition from PC-laptop vendors will eventually force Apple to provide PowerBooks with truly convenient Ethernet capability: a PCMCIA slot that lets you pop in a credit-card-sized Ethernet card whenever you need to connect. Hey, if they can do it for the Newton...

Kelli Wiseth, a former *MacUser* senior editor, heads NetResults, a network consulting company based in the San Francisco Bay Area. Jessica Beyer, a project leader at ZD Labs, managed the testing for this story.

continues ►

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CIRCLE 101 ON READER SERVICE CARD.



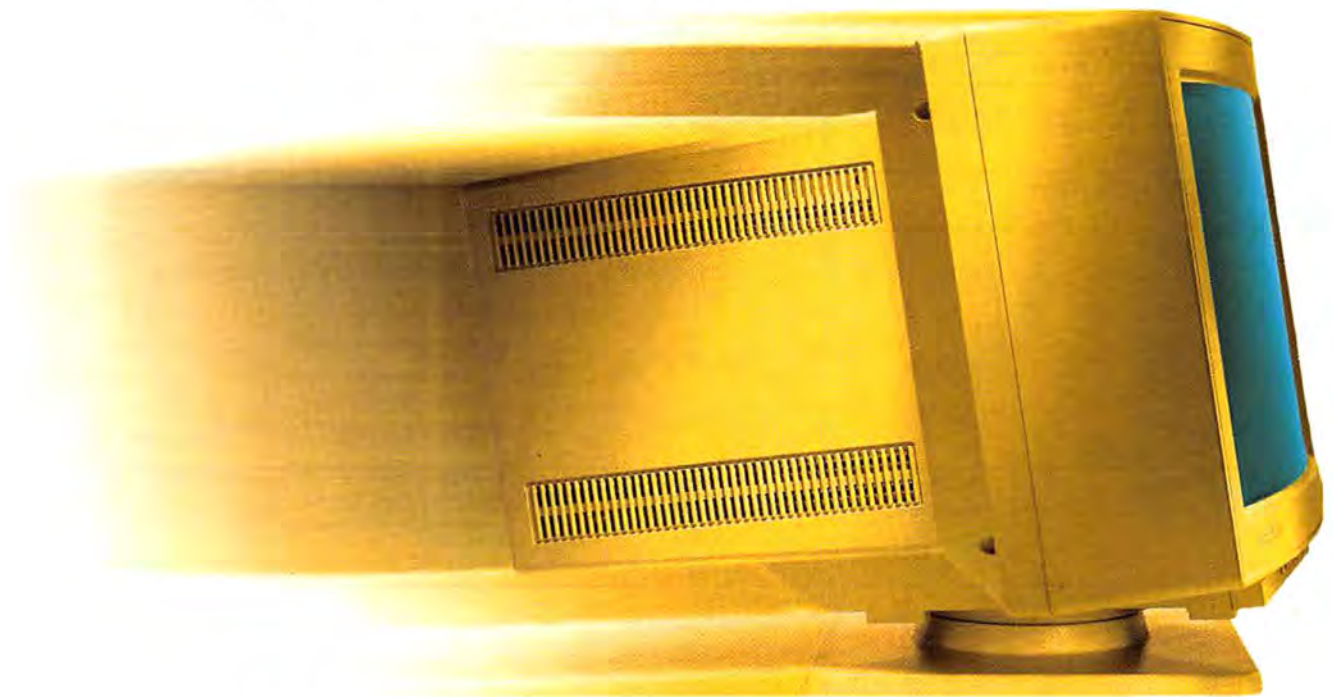
**Table 1: Which Way to the Ethernet?**

	Asanté EN/SC-PB \$\$\$	▶ Asanté Mini EN/SC-T \$\$\$\$½	Cabletron EA412 \$\$\$½	Compatible Ether+ \$\$\$
<b>List price</b>	\$499	\$369	\$525	\$495
<b>Pros</b>	Connectors for all cable types. Fastest throughput.	Smallest footprint. Lightest. Fastest throughput. Auto-senses cable type.	SNMP management. Excellent diagnostics.	Connectors for thinnet and twisted-pair cable.
<b>Cons</b>	Can't fit in middle of SCSI chain.	Can't fit in middle of SCSI chain.	Most expensive. Slowest throughput. Bulky. Doesn't include SCSI cable.	Largest footprint. Heaviest. Must be last or only SCSI device. Doesn't include SCSI cable. Inconvenient cable-type selection.
<b>Licensed from</b>	NA	NA	NA	NA
<b>Dimensions (L x W x H)</b>	8 x 4 x 1.5 in.	4.3 x 2.75 x 1 in.	7 x 3.25 x 1 in.	7.5 x 5.5 x 1.5 in.
<b>Weight of adapter</b>	1.5 lb	6 oz	12 oz	1.6 lb
<b>Weight w/ power supply and SCSI cable</b>	2.86 lb	1.56 lb	1.86 lb	3.52 lb
<b>Network cables included</b>	12-inch UTP cable, BNC-T connector	12-inch UTP cable	none	none
<b>SCSI</b>				
Cable included	HDI-30 to DB-25	DB-25 to DB-25/DB-25, HDI-30 to DB-25/DB-25	DB-25 to DB-25 (HDI-30 to DB-25 costs \$45 extra)	none (HDI-30 to DB-25 costs \$25 extra)
Interface	proprietary	proprietary	Western Digital 33C93	NCR 53C80
Number of SCSI ports	2	1 (2 with cable)	1 (2 with \$45 adapter)	1
Termination	internal	external switch	external switch	internal
Disable termination	no	yes	yes	no
<b>Software</b>	TroubleShooter	TroubleShooter	ExxxDiags, EtherEcho, management control panel, Ethernet Stats extension	Manager+
<b>Ethernet features</b>				
Ethernet controller	National 83902	National 83902	National 83902	DP8390
Connectors included	RJ-45, AUI, BNC	RJ-45, BNC	RJ-45 (multiconnector models with auto-sensing available)	RJ-45, AUI
Cable-type selection method	external switch	auto-sensing	NA	internal jumper
LEDs	power, traffic, link integrity	power, network activity, link integrity, link integrity disabled, SCSI termination	transmit, receive, collision, link integrity	power, link integrity, send, receive
Disable link integrity	no	yes	no	no
<b>Warranty</b>	5 years	5 years	varies	1 year
<b>Company</b>	Asanté Technologies 821 Fox Ln. San Jose, CA 95131 800-662-9686 408-435-8388 408-432-7515 (fax)	Asanté Technologies 821 Fox Ln. San Jose, CA 95131 800-662-9686 408-435-8388 408-432-7515 (fax)	Cabletron Systems 35 Industrial Wy. Rochester, NH 03867 603-332-9400 603-332-7386	Compatible Systems P.O. Box 17220 Boulder, CO 80308 800-356-0283 303-444-9532 303-444-9595 (fax)

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**Table 1: Which Way to the Ethernet? continued**

	► Dayna DaynaPORT SCSI/Link-T PB \$\$\$	► Farallon EtherMac SCSI/PB 10BASE-T \$\$\$	Focus EtherLAN SC-T \$\$\$	TechWorks Ethernet SC-T \$\$\$
List price	\$429	\$359	\$299	\$429
Pros	Fits anywhere in SCSI chain. Lifetime warranty. All settings external.	Second-least expensive. Fits anywhere in SCSI chain. Lifetime warranty. All settings external.	Least expensive. Connections for thinnet and twisted-pair cable.	Lifetime warranty.
Cons	Bulky.	Only one Ethernet connector. Bulky.	Largest footprint. Heaviest. Must be last or only SCSI device. Doesn't include SCSI cable. Inconvenient cable-type selection.	Largest footprint. Heaviest. Must be last or only SCSI device. Inconvenient cable-type selection.
Licensed from	NA	Dayna	Compatible	Compatible
Dimensions (L x W x H)	6 x 3.25 x 1.75 in.	6 x 3.25 x 1.75 in.	7.5 x 5.5 x 1.5 in.	7.5 x 5.5 x 1.5 in.
Weight of adapter	13 oz	13 oz	1.6 lb	1.6 lb
Weight w/ power supply and SCSI cable	1.98 lb	2.02 lb	3.52 lb	3.52 lb
Network cables included	none	none	none	none
SCSI				
Cable included	HDI-30 to DB-25	HDI-30 to DB-25	none (HDI-30 to DB-25 costs \$25 extra)	HDI-30 to DB-25
Interface	NCR 5380	NCR 5380	NCR 53C80	NCR 53C80
Number of SCSI ports	2	2	1	1
Termination	external switch	external switch	internal	internal
Disable termination	yes	yes	no	no
Software	Software Diagnostics, Hardware Diagnostics, SendEcho	Software Diagnostics, Hardware Diagnostics, SendEcho	NuvoLink SC Setup (same as Compatible's Manager+)	Ethernet SC Setup (same as Compatible's Manager+)
Ethernet features				
Ethernet controller	National 83902	National 83902	DP8390	DP8390
Connectors included	RJ-45 (three-connector model with auto-sensing also available)	RJ-45 (no multiconnector models available)	RJ-45, AUI	RJ-45, AUI
Cable-type selection method	NA	NA	internal jumper	internal jumper
LEDs	power, link status, activity	power, link status, activity	power, link integrity, send, receive	power, link integrity, send, receive
Disable link integrity	no	no	no	no
Warranty	lifetime	lifetime	3 years	lifetime
Company	Dayna Communications 849 W. Levoy Dr. Salt Lake City, UT 84123 801-269-7200 801-2698-7363 (fax)	Farallon Computing 2470 Mariner Sq. Loop Alameda, CA 94501 510-814-5100 510-814-5020 (fax)	Focus Enhancements 800 W. Cummings Pk. Ste. 450 Woburn, MA 01801 800-538-8866 617-938-8088 617-938-7741 (fax)	Technology Works 4030 Braker Ln. W. Austin, TX 78759 800-677-3219 512-794-8533 512-794-8520

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EYES	Hazel	SEX	M

CASE NO: 63210



ARRESTING OFFICER	Danny Kim		
PLACE OF ARREST	Fairmont Drive		
CRIME	Computer Tampering		
3 counts/started ZUC virus			

CASE NO: 38271



NAME	Doug Nester		
AGE	32	WEIGHT	164
HEIGHT	5'3"	HAIR	Blonde
EYES	Brown	SEX	M
ARRESTING OFFICER	Sgt. Hans Logie		
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Translates Spreadsheets				✓			
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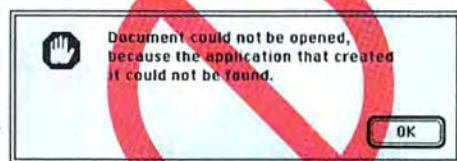
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
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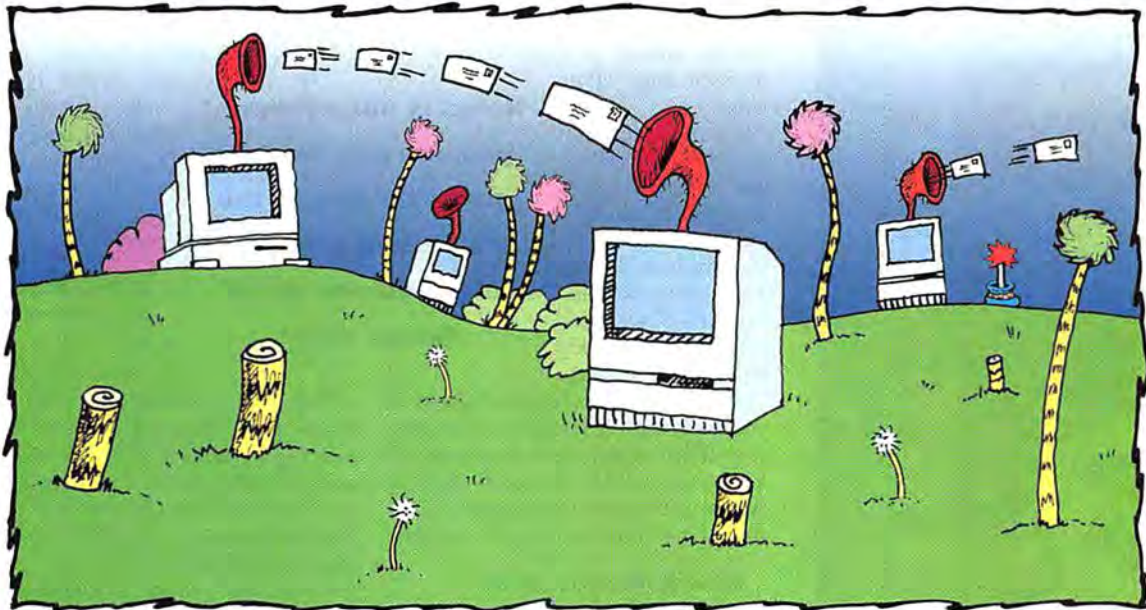
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# Lotus Notes: Who Needs It?



*Before you buy in to the hype, you'd better find out  
what Notes can — and can't — do.*

**By John Rizzo**

In the children's story *The Lorax*, Dr. Seuss describes a product called a *thneed*, the thing that everyone needs. The selling point of a thneed is that anyone can use it to do just about anything. Not surprisingly, thneeds do very well in the marketplace.

You may have heard similar descriptions of Lotus Notes, the cross-platform work-flow and communications system/database-development environment for PCs and (with version 3.0) Macs, from Lotus Development (617-577-8500). The people who categorize Notes as a multiplatform thneed tend to be idealistic types — MIS coordinators, PC-magazine editors, and the like. You get a more mixed reaction when you talk to Notes users and developers.

Notes certainly has some useful capabilities, but the hype surrounding the product has created unrealistic expectations too. There are also problems with Notes' Mac client software in terms of performance and interface: Basically, it lacks both. Any decision to implement Notes needs to be thought out carefully beforehand, and alternatives — and there are alternatives — should be considered.

## **What Notes Does**

Notes has three basic functions: work-flow management, database capabilities, and communications. It's at its most powerful when it's used to develop work-flow applications such as those for travel authorization, purchase approval,

customer tracking, and ongoing project management. These systems normally are built with multiple shared databases that reside on the Notes server and are accessed through the Notes client software. The databases usually contain documents, which multiple users can access through outlinelike lists.

The shared databases all reside on PC servers running IBM's OS/2 (you can also have a Windows Notes server, but Macs can access only the OS/2 version). The Notes server provides a good deal of data reliability, in that users don't actually access identical documents: Notes replicates each document for each user and again for each server. Whenever anyone edits a document, a new version is created. A database is usually set so that users see the newest version of a document but can retrieve old versions.

A Notes database is not a replacement for the kind of mission-critical, high-transaction database typically built with database-management programs such as Oracle or SYBASE. Although you can link Notes databases so that one database can automatically launch another, Notes databases are flat-file, not relational. Notes is also too slow to use for a database that is being accessed constantly.

The third aspect of Notes consists of rudimentary e-mail, a conferencing system, and an electronic bulletin board (a handy feature for people buried in e-mail, because it lets them choose just those threads they want to read). You can use Lotus' cc:Mail, which is superior to Notes' primitive, built-in



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## MAC TO PC

e-mail, from within Notes. To do so, however, you need to purchase cc:Mail separately. Notes also has some features in common with AOCE (Apple Open Collaboration Environment), including directory services, encryption, and authentication. Notes is not AOCE-compatible, though, so these features can be used only within Notes.

Clearly, the communications capabilities of Notes don't offer a whole heck of a lot new to Mac users. If all you want is e-mail connectivity with existing PC Notes users, I recommend you skip Notes and just use cc:Mail. If you already have QuickMail, you can install a QuickMail/cc:Mail gateway. If you're looking to set up a brand-new Mac-to-PC mail/conferencing system, you can buy better systems (SoftArc's First Class, for one) for a lot less.

### What Notes Doesn't Do

Notes Mac client software is glacially slow (I know of at least one company that is buying PCs for selected Mac users rather than have them run Notes on their Macs). The remote link is so slow, in fact, that it makes AppleTalk Remote Access look superfast.

In addition, the interface seems designed to keep you from getting work done. A confusing array of 25 foreign-looking icons surrounds the Workspace window, which is a kind of Notes Finder. And the Workspace window itself contains icons of databases. Unlike with the Mac's Finder, you can't list the icons by name, so the Workspace window takes up most of your screen. That's not the end of it either, because Notes soon clutters your screen with other windows, which you often need to open to get to your data.

All this is to give you the illusion that Notes has a graphical interface, but it's only an illusion. The database-form creator contains no drawing tools — you can't even put boxes around fields, although the fields can contain graphics. You can add a check box, but you can't see it while you're in design mode.

Mac users will also find unexpected behavior in the simplest things. Hitting the Delete key can close windows; you can select text in situations where you

can't act on it; and you can open the same document twice, but the windows aren't numbered — the duplicate windows have exactly the same name. Mac users will need to learn a new vocabulary too, such as "launching a file" instead of "opening a file." This non-Macness even extends to Notes' manuals:

There isn't a single screen shot of a Mac anywhere in the documentation, which uses illustrations of Windows machines instead.

**Notes is not a product you can use straight out of the box — the Mac client software alone comes on 19 floppy disks.**

### A First-Class Alternative

First Class, from SoftArc (416-299-4723), is one alternative to Notes. Like Notes, First Class uses the same interface in its Mac and Windows versions, and although there is a learning curve — First Class retains some of the UNIX-like remnants of the e-mail/bulletin-board system from which it evolved — the interface uses graphics in a more intelligent manner than Notes. The First Class server software also runs on Macs, and SoftArc is planning server software for other platforms. Version 2.5 of First Class lets you create work-flow, database, and communications systems, as does Notes, but the two programs' strengths and weaknesses lie in different areas.

In the work-flow area, Notes is more flexible and has more built in to it for creating work-flow applications. Although First Class doesn't contain databases, it lets you create forms that interface with external databases.

The First Class Desktop, equivalent to the Notes Workspace window, is where you access databases. Like in Notes, a database is represented by an icon; double-clicking on the icon brings up a form. Unlike Notes, First Class lets you view databases by name, date, and size, the same way you view files in the Finder.

Although you can use First Class to create work-flow applications, the product is better at providing more-traditional database access. Because First Class can access mainframe-based SQL databases through Apple's DAL (Data Access Language), it's more suitable than Notes for high-transaction applications.

First Class really outshines Notes as a group-communications system for e-mail, conferencing, and bulletin-board




functions. Its remote e-mail is fast and full-featured, and new directory services allow you to send a message across the country without having to know the exact spelling of the intended recipient's name. Directory synchronization is automatic, and you can also set up systems to send mail over several servers. In contrast to the Notes bulletin board, which you have to build yourself, the First Class bulletin board is built-in and feature-rich.

### Developing a System

Notes is not a product you can use straight out of the box — the Mac client software alone comes on 19 floppy disks. One Notes developer estimates that it takes about 500 person-hours to set up 100 users. The cost of software, development, and training can easily run from \$50,000 to more than a million dollars for a typical Notes installation.

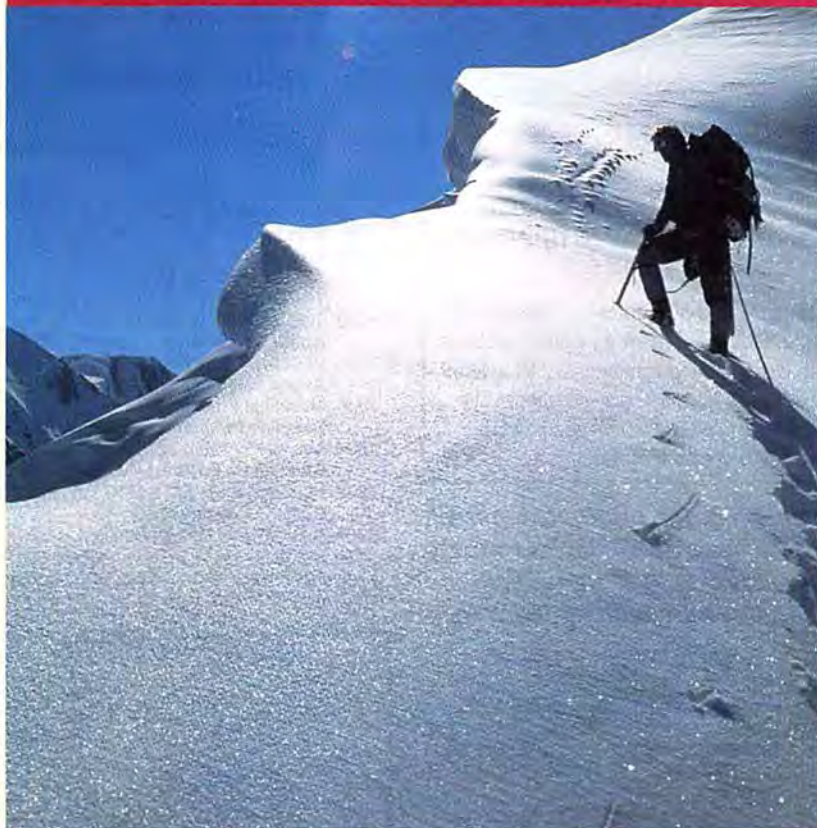
Notes is a flexible development environment, but it also provides a way to reinvent your company's work-flow processes. If you hire a developer to create your company's Notes system, make sure he or she knows as much as possible about your business and how it's run. Notes developers also recommend that you implement Notes in stages, according to a well-thought-out strategy. Anyone taking up Notes is going to run into a steep learning curve, so get your users accustomed to tracking information in a public manner and install databases in stages, so as not to overwhelm them.

First Class, on the other hand, can be up and running quickly. Of course, you will need substantial development work if you don't already have SQL databases to connect to. Even so, with First Class software costing \$395 for 5 network users or 100 dial-up users (versus \$495 per client for Notes), a First Class system should end up costing substantially less than its Lotus competitor.

It's too bad that neither Notes nor First Class yet supports AOCE or AppleScript; potentially, such support would completely integrate work-flow, database, and communications systems with everything users do on the Mac. AOCE represents the future of Mac workgroup computing, but it's only just started shipping, so I suppose we can cut Lotus and SoftArc some slack — for now. 

**MacUser** technical editor John Rizzo is the author of *MacUser Guide to Connectivity* and *How Macs Work*, both published by Ziff-Davis Press.

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10764 CPU/Virtual Bundle ..... 69.  
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5383 DoveFaxPB ..... 99.  
★ **Global Village ... 30 day MBG**  
7720 PowerPort/Silver.. 319. 7710 /Gold.. 369.  
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1092 Deluxe..... 75. 9585 Executive..... 115.  
5976 NoteBook Keypad ..... 79.  
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11965 Ultima Home Office -Powerbook ..... 289.  
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7425 PowerPad... 69. 7419 w/QuickKeys.. 109.  
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1199 Norton Essentials for PowerBook 1.1.... 87.  
★ **Targus ... 60 day MBG**  
11207 Leather PB Case 95. 1305 Universal 69.  
7369 NotePad 35. 6037 Premier Leather Case 169.  
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11841 WorldPort 14.4 Fax ..... 359.



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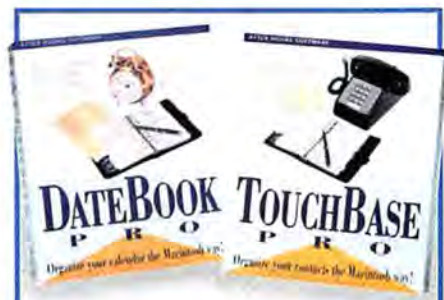
3012 PowerSwap (Swap batt. w/o shutdown) \$25.  
★ **Zoom Telephonics ... 30 day MBG**  
10737 FaxModem PBK ..... 92.

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5618 4th Dimension 3.0.1 ..... 575.  
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11795 InTouch/Managing Your Money Bundle 65.  
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11559 TOUCHBASE PRO/DATEBOOK PRO Bun. 89.  
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8881 Thunder 7 1.5.3 ..... 55.  
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5863 MultiLedger 3.0 225. 5862 Payroll 5.1 169.  
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5630 ClarixWorks/Quicken Bundle..... 199.  
3836 FileMaker Pro 2.1 265. 4752 Upgrd. 89.  
1745 MacProject Pro .... 399. 2190 Upgrd. 149.  
11202 MacWrite Pro ..... 169. 11475 Upgrd. 69.

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1768 Spelling Coach Pro 4.0 ..... 129.  
**IdeaFisher Systems, Inc.**  
11721 IdeaFisher 2.0 ..... 95.  
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11269 Inspiration 4.0 ..... 159.  
★ **Intuit ... 30 day MBG**  
11845 Quicken 4.0 ..... special 39.  
★ **Lotus Development ... 60 day MBG**  
12715 Special: 1-2-3 Mac & DeltaGraph Pro Bun. 99.  
**MECA**  
2796 Managing Your Money 5.0 ..... 32.  
★ **Microsoft ... 30 day MBG**  
Upgrades available ..... call  
2884 Works 3.0. 155. 3669 Excel 4.0 ..... 295.  
4902 Word 5.1.. 295. 2878 PowerPoint 3.0 295.  
2565 Project 3.0 445. 5454 MS Office 3.0.. 475.  
★ **Niles & Associates ... 30 day MBG**  
4602 EndNote 1.5.1.. 85. 8010 Plus 1.3 .. 142.  
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2981 WillMaker 4.0 35. 1204 Living Trust 43.  
★ **Now Software ... 30 day MBG**  
1793 Now Up-to-Date 65. 2366 (10 pack).. 519.  
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6975 Business Plan Toolkit 4.0 ..... 75.  
★ **Pastel Development ... 30 day MBG**  
1785 DayMaker 2.03 ..... 79.  
★ **Peachtree ... 60 day MBG**  
9584 Accounting for Mac..... 115.  
9588 Insight Accounting ..... 299.

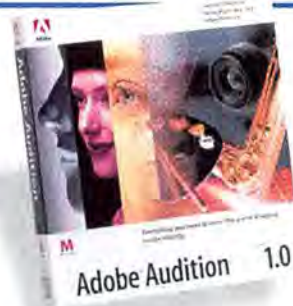


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6929 WealthBuilder 2.0 ..... 69.  
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8093 MacMoney 4.0 ..... 55.  
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4268 WordPerfect 3.0 299. 4711 Upgrade 55.  
11720 WordPerfect Works Bundle ..... special 99.  
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7664 WriteNow with Correct Grammar 3.0 .... 42.

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10167 Adobe Dimensions 93. 5001 Streamline 119.	
10289 SuperATM 89. 4145 Adobe Premiere 429.	
11843 Illustrator 5.0 368. 6644 Photoshop 548.	

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6674	Personal Press	129.	2461	Gallery Effects	128.
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3506	SuperPaint	99.	4751	Persuasion.....	325.
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1983 EPS Exchange 89. 1195 Fontographer 258.	
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### ★Apple Computer ... 30 day MBG

3008 Apple Font Pack .....	74.
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### Broderbund Software

3572 Kid Pix 1.2.. 34. 7293 Companion .....	23.
1427 Print Shop.. 35. 6281 TypeStyler 2.1 126.	

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4930 OmniPage Professional 629. 7705 Direct 189.	
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2518 MacDraw Pro 1.5 .....	265.
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11055 artWORKS.. 99. 6365 UltraPaint .....	54.
3227 Canvas 3.5 .....	259.

11955 Canvas Design, 11957 Imaging or 10660 Utility ToolPAK .....	ea. 34.
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### ★Eastman Kodak ... 30 day MBG

12270 Photo CD 29. 12265 ColorSense Mgr. 329.	
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### ★Expert Software ... 30 day MBG

4870 Expert Color Paint, 1737 Landscape, 8619 Home, or 1731 Office Design ea. 29.	
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### Fractal Design

1068 Sketcher 1.0 .....	93.
10402 Painter 2.0 265. 1564 PainterX2 special 79.	

### Gold Disk

12279 Astound 249. 12276 Animation Works 115.	
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### Graphsoft

11723 BluePrint.. 199. 11724 MiniCad +.. 589.	
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### Gryphon

4202 Morph 2.0 .....	149.
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### Postcraft International

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7612 QuarkXPress 3.2 .....	599.
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12264 JAG II (increase image quality) .....	89.
4761 Designer 3.0 000. 12280 addDepth 1.0 125.	

### ★Specular International ... 30 day MBG

4962 Infini-D 2.5 .....	699.
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8028 Futura II SX 459. 8027 Futura II LX 819.	
8005 Ultra LX .....	1189.

### ★Synergy Software ... 30 day MBG

6617 KaleidaGraph 3.0 .....	139.
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### ★T/Maker ... 30 day MBG

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3144 Incredible Image Pack .....	89.

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2515	Calc+,.....	36.	9578	Kaleidoscope...	25.

### ★Aladdin Systems ... 30 day MBG

7410 StuffIt SpaceSaver 3.4 34. 6740 Deluxe 65.	
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### ★Apple Computer ... 30 day MBG

1206 At Ease 44. 7072 QuickTime Starter Kit 105.	
1074 System 7.1 (with free PCTV video) .....	79.

### ★Berkeley Systems ... 30 day MBG

1502 The Disney Collection Screen Saver .....	28.
5737 After Dark 2.0x (30+ screens!) .....	28.
2198 More After Dark.. 23. 2196 Bundle .....	39.
3392 Star Trek: The Screen Saver .....	34.

### ★Binary Software ... 30 day MBG

11989 Square One 1.5 .....	45.
12475 Bloopers .....	19.

### Casa Blanca Works

1593 Drive7 2.3 .....	\$49.
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1727 CalendarMaker 39. 7927 QuickKeys 3.0 105.	
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10595 Safe & Sound 32. 5041 MacTools 2.0 89.	
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### ★Clarix Clear Choice ... 30 day MBG

11205 Retrieve It! .....	46.
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### ★Dantz Development ... 30 day MBG

9115 DiskFit Direct 1.0.. 29. 3393 Pro .....	72.
5255 Retrospect.. 145. 7945 Remote 2.0 .....	259.

### ★Datawatch ... 30 day MBG

4803 Virex/Mac 57. 11486 SuperSet Utilities 85.	
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### ★Fifth Generation ... 30 day MBG

5342 MacPak 1.0.. 96. 3955 Suitcase 2.1.3 53.	
7404 DiskDoubler 52. 4838 AutoDoubler .....	58.
12298 AutoDoubler/DiskDoubler Combo .....	85.
10398 CopyDoubler 39. 7704 Public Utilities .....	98.

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2999 Hard Disk Toolkit 125. 7929 Personal 49.	
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11731 TimesTwo (1.44).. 83. 11773 (800K).. 83.	
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### ★Harvard Systems Corp. ... 30 day MBG

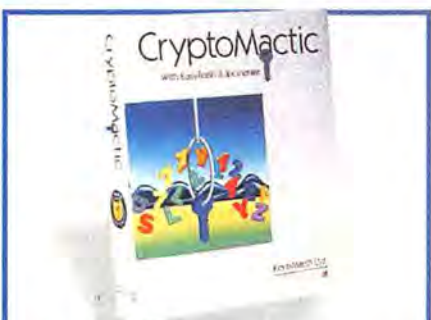
11193 Kai's Power Tools for Photoshop .....	89.
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- 5279 *SimCity Classic* 24. 11628 *A-Train Bun.* 45.
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7665 HP DeskWriter 550C ..... 669.

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**Peripheral Land, Inc. (PLI)**  
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 9516 PowerPath.. 105. 9518 LocalPath.. 139.  
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 6115 White Knight 11 ..... 85.  
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## POWER TOOLS

**Work smarter:** It had to happen — utilities for desktop Macs that offer the power-saving features available in PowerBook utilities. Connectix's CDU (Connectix Desktop Utilities)

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50 percent by dimming your screen or shutting the Mac down when it's not in use.

(Dimming the screen also cuts down on your exposure to electromagnetic emissions.) CDU does other

things too, such as letting you set file-sharing status, sound, and color depth from a special menu and customize the desktop color and look. 800-950-5880 or 415-571-5100. \$99. \* There are diagnostic programs for hard drives, so why not for floppy ones? MicroMat (maker of MacEKG) has filled the void with DriveTech, a diagnostic-testing and maintenance program for 3.5-inch floppy-disk drives. The DriveTech package also includes a head-cleaning kit for routine maintenance. 415-898-6227. \$59. \* Sneak Preview, from Logical Solutions, lets you instantly preview any document — graphics, text, even QuickTime movies — from the Finder. 612-659-2495. \$129.95.

**Dynamic Duos:** Here's a quick way to get files on and off your Duo or hook your Duo up to a CD-

ROM drive: The Lapis SCSI Dock, a \$199 docking unit, gives you a SCSI and an ADB port so you can easily connect to any Mac. The Duo's hard disk

appears in the Finder of the Mac it's connected to.


510-748-1600. \* **Recycle old PowerBook hard drives** with the ETC Purple Bullet, a \$99 NuBus

card that supports 2.5-inch drives and that can be used in most Macs as well as in Duo Docks (the \$15 ETC Purple Bullet Expander enables the card to accommodate 3.5-inch low-profile drives too). You can get the Purple Bullet as a kit or preconfigured with an 80-,

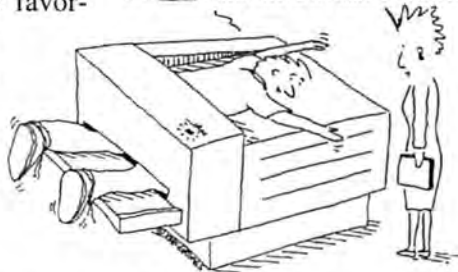
120-, or 213-megabyte hard drive. Included is ETC's Disk Tools 4.0 software, which lets you link several drives so they appear as one. 800-876-4382 or 813-884-2863.

**Power prints:** One of my all-time favor-

ite computer publications is *Flash* magazine. Compiled by the staff of Black Lightning, a toner-

cartridge manufacturer in Vermont, *Flash* is a compendium of laser-printing lore. Now Peachpit Press has published the best of *Flash* in *The Underground Guide to Laser Printers*. For \$12, you get tips, techniques, advice, and more. 800-283-9444 or 510-548-4393. \* The CoStar LabelWriter II's software has had a face-lift in version 2.0. Not only does it print POSTNET **postal bar codes** but it also now prints in the background. You can use the new software with CoStar's AddressWriter and Address Express label printers too. \$249.95. 800-426-7827 or 203-661-9700. 

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By Victoria von Biel



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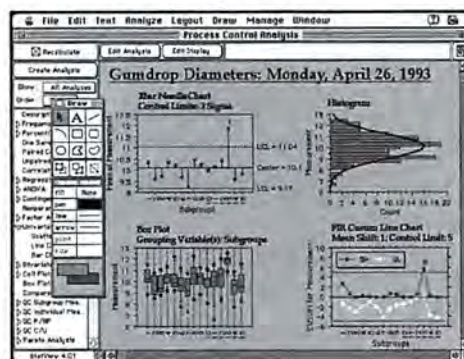
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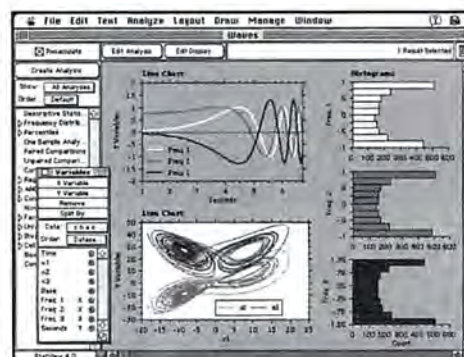
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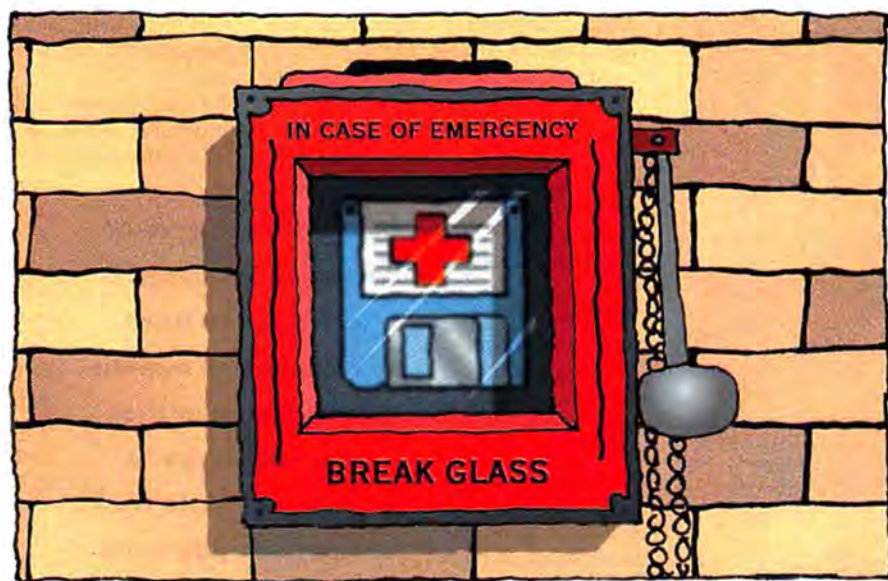
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# Hard-Drive CPR



*What do you do after your hard drive goes belly up?  
Here's a five-step plan that'll save your data — and your sanity.*

**By Craig Danuloff**

**A**ll of a sudden, it's gone, and you're overwhelmed with amazement, disbelief, fear, anger, self-pity, regret, and probably a little guilt. A hard-disk crash is never easy to deal with.

But the situation demands a cool head. In most cases, permanent damage or data loss has not happened yet and the steps you take after the crash will determine how big a problem you really have. Play your cards right, and you could be happily working again in just a few minutes. Make the wrong move, and you'll spend days and dollars having your drive repaired, re-creating lost data, reinstalling backup data and software, and being generally miserable.

The most common sign of a hard-disk crash is the question-mark-inside-a-floppy-disk icon that appears instead of the happy-Mac icon during startup. This might show up when you first turn on your Mac or, more commonly, after some type of system error or crash has forced you to manually restart your computer. If you have another startup device, such as an external hard drive or a removable-cartridge drive with a System Folder, you might find that your Mac starts up fine but one of your hard disks or cartridges fails to appear (mount) on the desktop.

Alternatively, your Mac might crash repeatedly during startup, crash every time a particular hard disk tries to mount, or display a dialog box asking whether you want to initialize the disk.

## First Things First

Dozens of things can cause a hard-disk crash, and many of them have little or nothing to do with the hard drive itself. So the best strategy is to move cautiously, investigating and eliminating possible causes one by one. Start with simple fixes, such as those described in step 1, that won't make your problem worse. Before you start, have the following tools near your Mac:

- A floppy disk containing the System and Finder files.
- The Disk Tools disk, which came with your Mac's system software.
- A copy of SCSIProbe or another SCSI-device-mounting utility.
- The formatting software that came with your hard drive or a universal formatting utility such as Drive7, from Casa Blanca Works.
- Data-recovery and disk-repair utilities such as Symantec's Norton Utilities, Central Point Software's MacTools, or Fifth Generation's Public Utilities.
- A complete, up-to-date backup of the important data on your hard disk.

Even though the *ultimate* goal of hard-disk recovery is to make the hard drive safe and usable again, your *first* goal should be to recover any data on the disk that has not already been backed up. The first time your crashed hard disk reappears, copy any files that haven't been backed up onto



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## POWER TOOLS TECHNIQUES

another hard or floppy disk. Once you're sure your data is safe, you can try to fix the drive.

### 1. The Simple Fix

There are several simple steps you should try first (in this order):

- Shut down the Mac and all connected devices, wait one to three minutes, and then restart.

- If the disk crashes during restart, hold down the Shift key during startup to disable all extensions (System 7 only).

- Start up from the Disk Tools disk, and run Disk First Aid.

- Start up from your emergency floppy, and launch SCSI-Probe. If it can see the disk but not mount it, the driver on the disk is bad. Update the driver, using your formatting utility.

- Disconnect all other SCSI devices (make sure they're turned off first). Repeat the preceding steps.

- If the disk crashes when attempting to mount, rebuild the desktop (hold down the Command and Option keys while restarting).

- Reset your parameter RAM (a.k.a. zap the PRAM). To do this in System 7, hold down Command-Option-P-R during restart until you hear the second chime. In System 6, hold down Command-Option-Control and choose the Control Panel, on the Apple menu.

### 2. Stronger Medicine

If none of the simple-fix methods get your drive back on its feet, at least you know you have a real problem. The next step is to use a SCSI-formatting utility to make contact with your disk and then a disk-recovery tool to try to repair the software.

- Start up from your emergency floppy disk (it should also include your hard-disk formatting utility). Run the formatter, and see if it recognizes your hard disk at the drive's SCSI address. Formatting utilities can often see disks that don't mount and that other utilities can't see. Some formatting utilities mount the disk automatically; others provide specific mount commands. Use the utility's

driver-update or test commands to try to fix the problem.

- If one formatting utility doesn't work, use another one. I have seen six formatters fail to recognize a disk, only to have the seventh mount it with no difficulty. Remember, if the disk mounts, grab your data.

- Once you've tried (successfully or unsuccessfully) to mount the disk by using a formatter, it's time to take a shot at data recovery.

**The ultimate goal of hard-disk recovery is to make the hard drive safe and usable again, but your first goal should be to recover any data that has not already been backed up.**

Use the emergency startup disk from Norton Utilities, MacTools, or Public Utilities, and attempt to repair the drive. If the program finds some problems and repairs them, restart to see if everything works. If you have more than one of these programs, use them all — they have different strengths and can sometimes solve problems in combination. Intermittently

rerun Disk First Aid as well. If the utilities can't see the disk or repair the problem or if they say they have corrected the problem but the drive still doesn't work right, it's time to get serious.

### 3. Last-Ditch Efforts

By now it's clear that you don't have just a problem, you have a crisis — the magnitude of which depends on when you last backed up your data.

- Disconnect the drive from your Mac, and connect it to another Mac. This isn't simple if you have an internal drive, but it's worth trying. Do all the above steps on the new machine.

- If your drive contains data you cannot afford to lose, send it to a data-recovery service. These firms will probably retrieve your data — they have remarkable success rates — and will usually repair your drive too. Such rescue work isn't cheap, usually costing from \$125 to \$350, but that's far less expensive than re-creating megabytes of lost work. Turn-around times vary from 24 hours to 5 days. Services include DriveSavers (415-883-4232), Data Recovery/Disk Repair (415-306-1100), Ontrack (800-752-7557 or 714-263-9245), and Computer Shoppe (619-384-4500).

- Use a formatting utility to initialize



the disk (do *not* reformat it), and then attempt to recover the data with a disk-repair utility. This is life on the edge, but when it works, it works flawlessly. Most of these programs have a better chance of recovering data if they were installed before the crash, but you can use them even if they weren't.

#### 4. Regaining Your Confidence


Once you've recovered data and re-erected your drive, you may be wary of ever trusting your drive again. This is not misplaced fear. To make sure you've fixed your drive, take the following steps:

- Run Disk First Aid and your data-recovery program again, making sure both give the drive a clean bill of health.
- Make a complete backup of the disk. Keep two backup sets, and store one of them off-site.
- Use the disk-testing tools of your formatting software to run read, write, and seek tests. Most can run in unattended mode and test overnight to give the drive a complete workout.
- Using your formatting software, update your disk's driver.
- Use a set of high-quality (the thicker, the better), matching SCSI cables. Most of us use a mixed bag of cheap cables that came with our drives and other SCSI devices. A new set of cables can prevent some headaches.
- Rid yourself of unnecessary or suspect system extensions.

#### 5. Throwing in the Towel

If there doesn't seem to be a way to get your data back and you have a recent backup or don't need to send the drive out to a data-recovery service, you can usually reformat the disk. If your preferred formatter doesn't work, try a few others. Usually, once one utility has formatted and initialized the disk, all other formatters work fine.

If none of your formatting software can see or reformat the disk, then the drive should be returned, if it's under warranty, or replaced. Because most hard drives have warranties ranging from one to five years, there's a good chance the drive is still under warranty. If you can't get satisfaction from the dealer who sold it to you, contact the drive's manufacturer directly.

And if it hasn't already occurred to you, go back up your data. Now. 

Craig Danuloff is the author of *The System 7 Book*.

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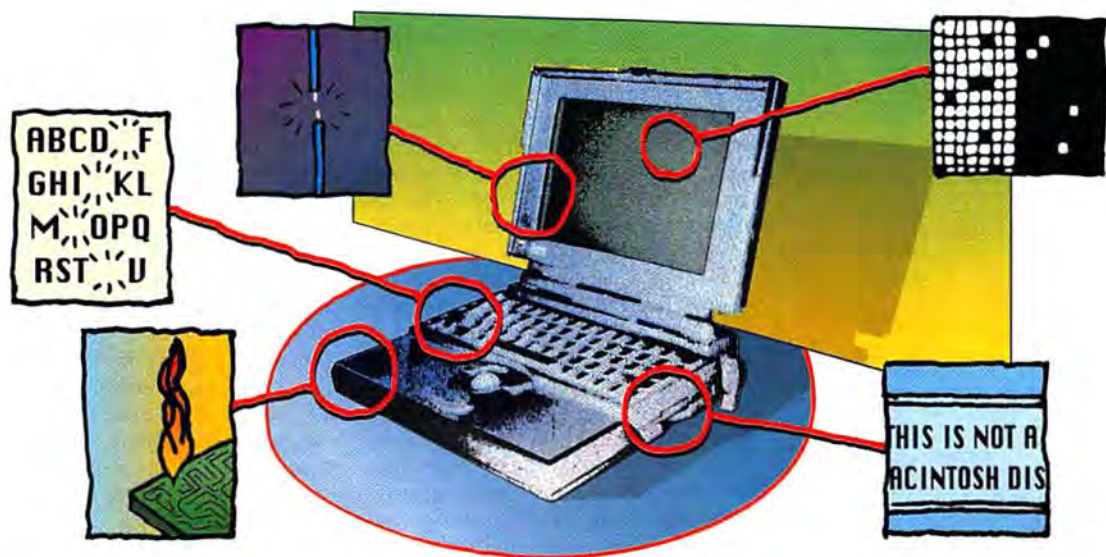
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# Five Free Fixes



*Did you know Apple fixes some PowerBook flaws for free?  
It does — but only if you know what to ask for.*

**By Sharon Zardetto Aker**

Is the PowerBook screen too small for you? Too bad. What did you expect from a computer that fits inside a briefcase? Need a mouse instead of a trackball? So, plug one in. You'll get no sympathy from me if you whine about design decisions that are inherent in the PowerBook's compact size.

But design *flaws* — well, that's another matter. You'll get not only sympathy but you may also get a free fix — even if your warranty period is up, in some cases. But who ya gonna call? You can try your Apple dealer (a species on the endangered list), or you can call Apple SOS, at 800-767-2775 (in the U.S. only). Apple SOS provides shipping both ways and has a short turnaround time. If you have a problem, ask these folks if they can fix it; if it's one of the problems listed here, ask if they'll fix it free, even if your warranty is up.

First, a note about PowerBook serial numbers. The first two characters indicate the manufacturing facility: F1 or F2 for Fremont, California, and CK for Cork, Ireland, for instance. The next digit is for the year: 1 is 1991 and so on. The next two digits are for the week of the year: 05 is the fifth week of the year — the end of January and beginning of February. The rest of the numbers identify your individual PowerBook.

## **Fabulous Free Fixes**

- An active-matrix screen with even a single stuck pixel — one that can't turn off, so it's always black — qualifies for a replacement. However, you need five *voids* (permanently white spots) to qualify for a similar replacement. Rumor has it

that two voids within an inch of each other may also get you a replacement if you're insistent enough.

- Screens on early PowerBook 140s and 145s had the disconcerting habit of flicking on and off, due to an internal cabling problem. If your screen problem straightens out when you squeeze the right side of the screen's frame, the cable is probably the culprit. The fix is a simple shim, already built in to models with serial numbers F2208xxx or higher, CK121xxx or higher, or any that start with FC.

- The original PowerBook 140 and 170 models often had problems reading floppy disks, giving you the "This is not a Macintosh disk" dialog box or read and write errors. Turning off the backlight often temporarily alleviated the problem, for the very good reason that inadequate shielding on the backlight converter had caused the problem in the first place. Later models (PowerBook 140s with serial numbers F2150xxx and higher and PowerBook 170s with serial numbers CK205xxx and higher) were built with adequate shielding. In the spring of 1992, a floppy drive that corrected the problem was phased in as well; models with the new drive are 4/40 140s with serial number F2211xxx and higher, 4/80 140s with serial number F2212xxx and higher, and 170s with serial numbers FC213xxx or CK213xxx and higher.

If you don't have one of the factory-fixed models and you're having trouble with your floppy drive, you can either have the shielding fixed or have the revised drive installed. Go for the revised drive if you have any say in the matter.



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## POWER TOOLS MOBILE MAC

• Apple instituted its first and only recall in September 1992 because of the "meltdown" problem caused by a too-tall pin on the motherboard that shorted against the inside of the case, causing enough heat to melt a small hole in the case. PowerBook 100s with serial numbers SQ211xxx or SS216xxx and higher don't have the problem. If your 100 went back to Apple for any reason, the lead was probably clipped while it was there. The repairpeople place a small sticker containing the ® symbol next to the serial number when they make this repair.

• Early Duos had some keyboard problems — keys that repeated and/or a space bar (or some other keys) that didn't type at all. The only fix is a replacement keyboard. A revised (Rev B) keyboard was phased in almost immediately, but if you were the first on your block to own a Duo, you probably have the early, erratic keyboard. If you know how to take your Duo apart, look at the serial number on the underside of the keyboard — the revised ones have a B at the end.

If you're still experiencing keyboard problems, it's likely that your Duo's been opened and, when it was put back together, the screws on the bottom were overtightened. Try loosening them, especially the one in the center, with a T8 Torx screwdriver.

### Off on the Wrong Foot

That's it for the really serious stuff (not counting the Duo's Express Modem, which deserves an entire article). But there are two more constant — albeit minor — irritations: the PowerBook

100's feet and the back flap (I/O door) on the PowerBook 140, 145, 170, and 180 — each of which breaks with infuriating frequency.

Because the original PowerBook 100's elevation feet broke so easily, free replacements were (and still are) provided. But because replacing the feet on a 100 usually involves opening the case, this fix can be a major nuisance. Luckily, a sturdier design was phased in early on in the 100's production, and if you get replacement feet, they'll be of the newer design.

As for that I/O door, it's a shoddy detail on a solidly designed case. The little nubs that act as hinges often break off *inside* the holes in the case. I went through four doors on my PowerBook 170 in one year; now I just go doorless. It's possible to get a free replacement or two, but if you're going to bother fixing it, you might as well order half a dozen at a time — you'll use 'em all.

### System Sneaks

And now for something completely different. I recently had an unexpected problem with two PowerBook-utility packages, Connectix's CPU 2.0 and Claris Clear Choice's Power to Go. The problems started when I installed CPU, which checks whether you're on battery or AC power and sets the PowerBook CPU's speed accordingly. If you start the machine and CPU sees that the processor is set at the wrong speed, it restarts the computer at the correct speed. After checking out CPU, I disabled it and installed Power to Go. Unfortunately,

## PowerBook Secrets: Get the Right Cable

There's lots of confusion between the two SCSI cables Apple sells for the PowerBooks. Each cable has the special HDI-30 SCSI connector, but that's the extent of their similarity. The HDI-30 System Cable (Apple part #M2538) is 18 inches long, is light gray, and has a 50-pin male connector; the square HDI-30 end is missing one pin. This cable is used to attach external SCSI devices to your PowerBook. The HDI-30 SCSI Adapter Cable (Apple part #M2539) is 10 inches long, is dark gray, and has a 50-pin female connector; the square end has all 30 pins. Using this cable in conjunction with a standard SCSI cable and a pass-through terminator puts your PowerBook into SCSI-disk mode so it can act as an external hard drive for another Mac. It's that 30th pin that tells the PowerBook to go into SCSI-disk mode rather than just boot up normally.

APS (800-645-5401 or 816-483-6100) has two terrific solutions to the cable confusion. Its 2-inch SCSI Boy has an HDI-30 connector on one end and a 25-pin connector on the other, effectively giving the back of your PowerBook the same SCSI-port configuration as the back of a desktop Mac. Another product, called the SCSI Doc, has a switch that lets it work as either a SCSI cable or a SCSI-disk adapter. And they're cheaper than either of Apple's cables.

— Rich Wolfson



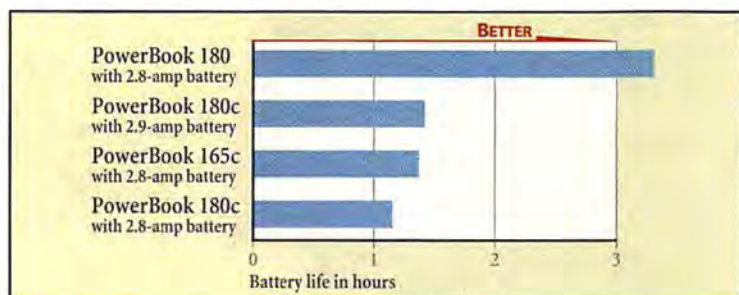


## Color-PowerBook Batteries Die Young

ZD Labs test results show the life per charge of a color-PowerBook battery is only 40 percent that of a battery for a noncolor model, which means 165c and 180c users can expect their batteries to typically last less than an hour and a half per charge. (ZD Labs used Apple's 2.8-amp battery to test battery-charge life in the noncolor 180 and the color 165c and 180c; the labs also tested the 180c with Apple's new 2.9-amp battery, now shipping in all models.) What causes the power drain? The main culprit is the fluorescent tube that backlights the screen. Noncolor PowerBooks have just one power-hungry bulb; color PowerBooks have two.

With their painfully short battery life and high price, color PowerBooks are probably best suited only for those who *must* have color on the go. If you don't fall into that category, you still have some colorful options: All PowerBooks from the 160 up have a video-out port that yields 256 colors and supports external displays as large as 16 inches.

— Blake Roberts



the machine still double-booted on startup, although Power to Go doesn't reset it for anything.

I tried removing CPU, using its own installer, but the PowerBook still double-booted. I deinstalled Power to Go, but that didn't work. In desperation, I launched ResEdit and did something I really shouldn't have done: I deleted the #2 boot resource and restarted. My PowerBook went berserk. It restarted itself over and over and over again until I put it out of its misery by shutting it off. I finally reinstalled a clean system.

Lots of experimenting and terrific help from both companies pinned down the chain of events. CPU had installed a #2 resource *different* from the normal one in the system. And Power to Go's Airport module *appends* resource #2 and renames it. CPU's deinstall looked at #2; said, "Well, that's not mine"; and left it alone. Power to Go's removal process did nothing about the resource, because it's altered not at installation but only by the Airport module and that depends solely on the module's setting at shutdown. Even if I had managed to remove the Power to Go resource information, the reboot code from CPU would have remained forever.

Altering the System file without even

telling you is a major sin. What if you have system problems unrelated to your PowerBook utilities and you have to re-install your system? When certain options in your utility package stop working because they're missing from the System file, how in the world can you ever figure out what's gone wrong?

To Connectix's credit, its deinstall procedure removes its boot resource from the System file under normal circumstances and the manual does mention (in passing) that you should use the Remove function if you're taking CPU out. But the manual doesn't mention that CPU is messing with your System file, and it should. Power to Go's manual doesn't mention the System-file alteration, nor does it say that you should turn off the Airport module *before* removing the utility, to clean up your System file.

Both companies insist that altering the System file is the best and only way for their products to work; both also admit their manuals should contain more-complete information. Let's hope that if they stick with the first philosophy, they'll also follow up on the second.

**Sharon Zardetto Aker and Rich Wolfson cowrote the second edition of *PowerBook Companion*. Blake Roberts is a former Apple engineer.**

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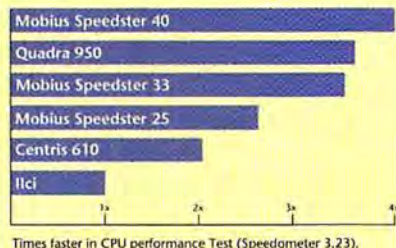
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**How to Buy**

# Backup Software

■ Make sure the software package you buy supports your **storage medium**. Some programs might not work with tape, and others don't work with SyQuest or optical-disc cartridges. If you're planning to mix media, either now or as your storage needs grow, make sure the software you buy can support different media.

■ **Ease of use** is important, because backups and restores are complex, multistep processes. The program you buy should have helpful documentation and an interface that makes sense to you. Because different backup programs can have very different interfaces, try to test-drive the program — either by using a friend's or a user group's copy or by calling the company to see if it has a demo version. And keep in mind who will be *using* the software — if your office mates aren't comfortable with the interface, they may avoid backing up their data.

■ Because performing backups over a network slows network speed to a crawl, most people back up at night. Although the need to run backups while everyone's out of the office has made **scripting** abilities standard in backup packages, the quality of those abilities differs from package to package. Make sure the package you buy gives you the amount of control you need, whether that's setting



*Using backup software can make  
the job of protecting your  
files painless, if you buy  
the program that's right for you.*

the system to back up every day or choosing to back up just a few specific folders on specific computers at specific intervals.

■ If you must back up while people in the office are still working, make sure the software you buy can work in the background, letting you do **two things at once**. But be warned: The Mac running the backup, the network you're backing up on (if you're backing up more than one Mac), and the Mac whose hard disk is being backed up will all take a performance hit.

■ After you've bought your software, **back up your files often**. To decide how often you should back up, take a look at what kind of work you're doing. If you write 40 or 50 short documents every

day, you'll want to back up frequently so those files aren't lost. If you work on just a few files over a long period (working with Photoshop, for instance), you might be able to back up less often. The files that you rarely (if ever) alter, such as applications, don't need to be backed up very often, because they take up a lot of space and don't change from week to week. Just be sure that you *do* have backup copies of your applications somewhere safe. And no matter what, back up your data regularly.


■ If you're worried about **data security** — whether you're afraid that people will steal your backup tapes or spy over your network while a backup is in progress — check to see if the package you're planning to buy will allow

you to add password protection or data encryption to your backups.

■ To make your data as secure as possible, consider doing **generational backups**: Back up on two or more cartridges, for example, and rotate the backups. With three tape cartridges, you can perform a backup on a new tape on each of three days. On the fourth day, write over the first tape. When you need to restore data, use the most recent version. If that tape is defective, you'll have two previous versions to fall back on.

■ Be sure to store your backups **off-site**. That way, if something catastrophic happens to your workplace, the backups won't be lost along with the original data (see "The Best Backup Strategies," October '91, page 206).

■ If you haven't chosen a piece of **hardware** for backing up your files, consider how much space you're going to need and how fast you need the system to be. Tape drives allow you lots of storage space and are fast. If you aren't planning to back up large amounts of data (for example, if you're backing up only a personal Mac) and don't care much about speed, you might be able to get by with optical-disc or SyQuest cartridges as your storage medium.

■ For more information, see "Building a Data Safety Net," September '93, page 208. 

**By Jason Snell**



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**CIRCLE 158 ON READER SERVICE CARD.**



**Upgrading the**

# LC II/ Performa 400/405

*Turn your LC II or equivalent Performa into an LC III for just \$600!*

*Or spend a similar amount to boost your speed or monitor size.*

If the 25-megahertz LC III logic-board upgrade isn't speedy enough, you can look to companies such as DayStar Digital (800-962-2077 or 404-967-2077) for an **accelerator** that fits the 96-pin PDS. DayStar has a PowerCache adapter (about \$100) for its line of 33-, 40-, and 50-megahertz 68030 Universal PowerCache cards (about \$400 to \$900).

The Macintosh LC II and its Performa equivalents have 4 megabytes of RAM on the logic board plus two 30-pin SIMM slots. By adding two 4-megabyte SIMMs — about \$160 each at press time from sources such as Chip Merchant (800-426-6375 or 619-268-4774) and Technology Works (800-928-3148 or 512-794-8533) — you can upgrade to **10 megabytes of RAM** (the maximum amount of RAM these machines can access without an LC III upgrade).

Installing a **higher-capacity internal hard drive** maintains the LC II's/Performa's easy portability. Sources such as APS (800-645-5401 or 816-478-8300) and River Computer (800-998-0096 or 802-496-7650) carry 120- to 340-megabyte drives priced from \$200 to \$500.

Replace the 256K VRAM SIMM in your Performa 405 or LC II 4/40 with a 512K SIMM (already present in the Performa 400 and LC II 4/80) to **see more colors**. You can buy VRAM from the same sources you turn to for RAM (about \$30 to \$50 for a 512K SIMM). Apple sells a VRAM kit as well, but it costs \$159.

**T**he Macintosh LC II and Performa 400 are in fact exactly the same computer — they just have different monikers for marketing reasons (the Performa 405 is a minor variation). All three machines are powered by a 16-megahertz 68030 micro-processor that is certainly powerful enough to accommodate

most everyday home, school, and business tasks.

Sophisticated DTP, graphics, and video users are likely to find the processing speed sluggish, however. Accelerators that double or even triple your processor's speed are easy to obtain and install, but you should start by looking at Apple's LC III

**By Tom Petaccia**



logic-board upgrade. For \$599, you get a complete logic-board and case swap — one of Apple's best bargains ever. The result is a 25-megahertz 68030 LC III, with 4 megabytes of RAM on the logic board and larger-monitor support (32,768

colors on 12- to 14-inch monitors, 256 on 16-inch monitors) via additional VRAM. Unlike with an accelerator, you still have your PDS (processor-direct slot) free for a video card or other options.

If you go for the upgrade, you'll lose

any RAM installed in your SIMM slots (because the LC III has a single 72-pin SIMM slot that doesn't accept the old RAM), but you'll be better off in the long run; the new SIMM slot can accept a SIMM with a capacity as large as 32 megabytes, giving you 36 megabytes of RAM. This way, you can break the ridiculous 10-megabyte barrier these machines now carry even with third-party accelerators.

A Performa's 80-megabyte internal hard drive is enough for most everyday

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**CIRCLE 108 ON READER SERVICE CARD.**

**With room for just one  
PDS card, you may  
need to choose between  
a faster computer and  
a bigger screen. We  
recommend going faster;  
bigger isn't all  
it's cracked up to be.**

users. However, it never hurts to have additional storage — especially if you have an LC II with a 40-megabyte drive instead of the 80-megabyte model. Adding an external device is easier, but you'll save 25 percent or more of the cost by installing a 3.5-inch, low-power, one-third-height internal SCSI drive — you can do it yourself in about 15 minutes with a Phillips-head screwdriver.

Want a bigger screen too? To go larger than a 14-inch monitor (16-inch if you get the LC III logic-board upgrade), you'll need to buy a video card. PDS video cards are available by mail order for about \$400 (8-bit) to \$600 (24-bit) from companies such as Radius (800-227-2795 or 408-434-1010). Often, such cards are also bundled with monitors.

Remember, though, that these machines have room for only one PDS card; you may have to choose between a faster computer and a bigger screen (or an Apple IIe emulation card, for that matter). We recommend going faster. Bigger isn't all it's cracked up to be — especially if the cost of the monitor means you're spending more as well.

If you *really* want bigger, the street price of a brand-new, faster Centris 610 is about \$2,000, and it's capable of supporting a color monitor as large as 21 inches on VRAM alone. 



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**CIRCLE 22 ON READER SERVICE CARD.**



# You don't need a crystal ball to see where multimedia is going. What you need is a box.



Actually, what you see here is far more than just a box. Our Orientation Kit is your entree to the Apple® Multimedia Program and your direct link to the future of multimedia. So, whether you're a designer, developer, educator, publisher or marketer—or just looking to get involved—you should get with the Apple Multimedia Program. An annual membership fee connects you to some of the best minds and most successful members of the multimedia community. For starters, we'll send you the Apple Multimedia Orientation Kit plus an ongoing supply of valuable tools, information and updates. Membership includes special discounts, a personal AppleLink® address and a "Members Only" bulletin board that lets you tap into technical and marketing tips and techniques. You'll receive how-to guidebooks and videos with advice from proven developers. You'll see how businesses are using multimedia to be more effective and productive in their operations. You'll get key market research reports, so you'll know where the opportunities are. There's even a directory of multimedia products and services, so you can find exactly what you're looking for. For a membership application, call (408) 974-4897. That way, the future can't happen without you.

## Apple Multimedia Program






## TIP SHEET

**N**obody ever said you had to live in Cupertino to be a Macintosh expert. Know-it-alls are everywhere, from Manhattan to Malibu — even in Waldport, Oregon, where we found our own Mac guru, Philip Russell. Each month Phil shares his own tips plus the best from 70-odd Macintosh-user-group (MUG) magazines. But Phil can't do it alone. To all those whose undocumented Mac tip *MacUser* prints, we pay \$25, and the Reader Tip of the Month earns \$100.

 Send your tip, together with your name, address, and phone number, to Tip Sheet, c/o *MacUser*, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

You can also contribute tips electronically via

 ZiffNet/Mac, the on-line service for *MacUser*. Send them to

Gregory Wasson at 72511.36. Be sure to include your full name and mailing address along with the text of the tip.

By Philip Russell

Reader tips compiled by Gregory Wasson

■ Extra-long column titles in **Excel 4.0** can either be word-wrapped to occupy more depth or rotated so they're vertical. To do either, select the cell you're going to work on. Then select Alignment, on the Format menu, and either check Wrap Text or click on the rotated-text picture you prefer. Note: You can't do both to the same cell.

■ Pictures that are pasted into **Word 5** are formatted like paragraphs. To keep text from remaining in the picture paragraph, press Return before and after the picture to isolate it.

■ In order to prevent a button in **HyperCard** from doing something destructive (deleting a button or a field, for example), be sure you script an Ask dialog box to confirm the action. Why? Because HyperCard often has a hard time restoring deleted items.

■ Federal Express and UPS don't ship to APO addresses, so if you have friends overseas in the military who want to buy software, have the

mail-order company send it to you and then ship it yourself. All it costs you is the postage. (Thanks, Washington Apple Pi newsletter).

■ If a keyboard command equivalent in an application no longer works, check to see whether you have created a QuickKeys shortcut that uses the same keystroke and interferes with the application's built-in keyboard commands. Change whichever keystroke you use least.

■ For longer PowerBook battery life on the road, use the Geneva font, which is built in to the ROMs of all Macs and requires no additional memory. If you need another font, you can switch later.

■ Fast page turning in **PageMaker 4** is just a keystroke away. Command-Tab moves you forward one page. To go backward, add the Shift key. This works even *before* the screen redraws.

And did you know that repeatedly pressing the Tab key with the Command key held

down moves you forward several pages without showing the intervening pages?

■ Need to know how many times a certain word occurs in your document? Any word processor with a Change or Replace command can help. Just type the word in the Find box, tab to the Change To box, and type the word again. Be sure the entries are identical. The Mac will now find and report the number of occurrences without changing the word in question.

### Reader Tips

#### Rendering Programs

Here is a tip for people who use a graphics-rendering program. If you don't use your Mac when it is rendering an image, turn your screen saver off, because it can slow down the time it takes to process the image. If you're concerned about burn-in, turn the monitor off or dim it.

Mark Bradley  
Orangevale, CA

### Tip of the Month: ClarisWorks 2.0

Here's an easy way in ClarisWorks to change text into a graphic, letting you create special effects for logos and headlines.

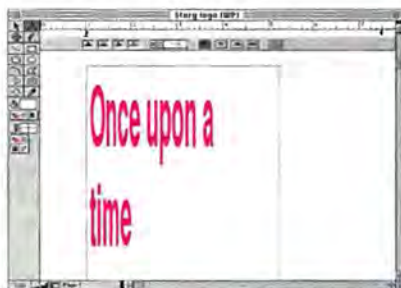
Within a ClarisWorks draw document, type the text you want to change. Next, save the document as a PICT file, open a new word-processing document, and insert the graphic file. To resize and distort the text's shape, select the text and stretch it in any direction. This technique lets you create special effects such as ultracondensed text.

Steve Yuroff  
West Chicago, IL

[You can do the same thing with your stand-alone word processor, even if it doesn't offer a drawing environment. All you need is the shareware package *Print2Pict*. Make sure *Print2Pict* is the current selection in the Chooser and that it is set to save as a PICT file. Use the custom paper sizes to trim the excess white space from the document, so that the graphic image you create won't be as large as the default page (8.5 x 11 inches for most users)

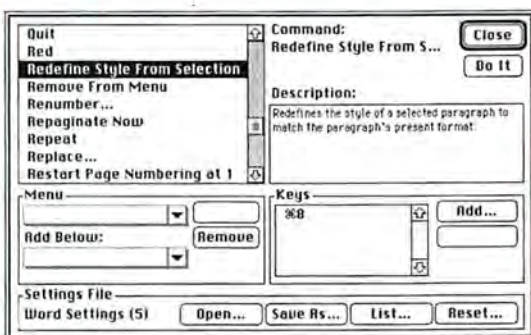
and include lots of unnecessary white space. Finally, import or place the PICT file into another document. You'll be able to distort it by resizing.

The *Print2Pict* shareware package is available through various on-line services. On ZiffNet/Mac, you'll find it listed as file *PSPIC.TPT* in Library 3 (Extensions) of the Download & Support Forum (GO ZMC:DOWNTECH). — Ed.]





## Word 5.1



Here's an easy way to redefine a style in Word 5.1: Choose Commands from the Tools menu. In the dialog box's scrolling list, select *Redefine Style From Selection*. Click on the Add button in the Menu or Keys section to add this command to a menu or a key, and go ahead and redefine your style.

Michael C. Miller  
Watertown, MA

## System 7 Finder

In a hurry to get to some of your folders? Create a folder on the Mac's desktop called *Quick System*, and store aliases of such folders as *Apple Menu Items*, *Extensions*, *Control Panels*, *Startup Items*, and *Fonts*. Now when you need to access these folders, you can avoid the long wait of opening the *System Folder* by opening just the folder you need.

Chris Parrish  
Norman, OK

## Clipboard

To show the Clipboard in System 7, even in programs that don't offer the *Show Clipboard* command, put an alias of *Clipboard* (located in the *System Folder*) into the *Apple Menu Items* folder.

Steve Huey  
Tampa, FL

## QuarkXPress 3.1

To rotate a line at a specific angle in *QuarkXPress 3.1*, first draw a straight line (press the Shift key and click on the straight-line tool). Then draw a text box underneath the line. Once both the line and box

are drawn, select both objects with the mover tool. Now an angle can be assigned to the line and the box with the *Item menu's Modify* command. (If you select *Modify* with just the line selected, there is no option for entering an angle.) When you're finished, delete the empty text box. The line you drew now appears at the desired angle.

Al Gilson  
Elmira, ON  
Canada

## Apple StyleWriter

If you need to print a thin line with an *Apple StyleWriter*, you can do so simply by drawing a hairline (the equivalent of one pixel) in a drawing program and then copying and pasting it into a word-processing document. You will get a line that's at least one point ( $\frac{1}{2}$  inch) thick. Another option for printing a hairline is to use an em-dash (Option-Shift-Hyphen) created with a *TrueType* or *PostScript* font and then adjust the point size to get the thickness you want.

Gene Poncelet  
Clearfield, UT

## Excel 4.0

Excel doesn't show the keyboard shortcut for *Save As* in the *File* menu, but it exists. Just press *Command-Shift-S*.  
Neil Schulman and  
David Bowling  
Oak Ridge, TN

## System 7 Aliases

You can use Apple's resource editor *ResEdit* (available from user groups and on-line services) to automatically remove the *alias* suffix when creating new aliases. First, make a copy of your *Finder*. Open the copy with *ResEdit*, and then open the *STR # resource* and *STR # ID 20500*. Change string #1 from *alias* to whatever you wish. Save the changes to the *Finder*. Start up from a different disk, and swap the modified *Finder* for the old version.

Gregory Tetrault  
Omaha, NE  
via ZiffNet/Mac

## HP LaserJet 4M and Word

If you have a *Hewlett-Packard LaserJet 4M*, the printer driver will not allow you to specify a particular paper cassette as your default tray. However, in many programs, the driver marks your file. This means whatever tray you select when you print a file is automatically selected when you print it again.

In order to take advantage of this feature with *Microsoft Word 5*, use the *New* command, type any character, and issue the *Print* command. When the *Print* dialog box opens, select as your default tray the paper source you want to keep and print the page. Next, select *Page Setup* from the *File* menu, click on *Use as Default*, and save the file. From now on, whenever you create a new document, your default paper source will be selected.

Ron Garrison  
Denver, CO

## System 7 Trash

Here's a quick way to have easy access to your *Trash* while keeping the *Trash* icon in its default location: Just make an alias of the *Trash* icon and position it close to your hard disk icon. You'll be able to trash files to the alias, but only the real *Trash* icon will bulge.

Murray M. Tuckerman  
Winchendon Springs, MA

## Word 5.1

*Microsoft Word 5.1* has a drag-and-drop feature that lets you quickly drag a selection to a new location without going through the usual cut-and-paste routine.

If you don't want to delete the selection from its original location, hold down the *Option* key while you're performing the drag-and-drop procedure. This will copy the selection to the desired destination without deleting the original.

Ben Balevi  
Toronto, ON  
Canada

## System 7 Finder

In theory, it is impossible to position an icon partly off the desktop, which means you can't save desktop space by having just the top of a folder or file showing along the bottom edge of your screen. But there is a way to trick the *Finder* into letting you do just that:

Drag the icon into a folder that is set to *View by Small Icon*. Now drag it back out onto the desktop, and bring it as close as possible to the bottom edge of the screen. Release, and as the icon pops into regular *Icon* view, you'll see that only the top of it is exposed. This trick works only for positioning icons along the left or bottom edge of the screen.

Joe Holmes  
Brooklyn, NY  
via ZiffNet/Mac



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## HELP FOLDER

**Q**uestions, anyone? Here's where to get answers from the experts. Bob LeVitus and Andy Ihnatko are the authors of the best-selling *Dr. Macintosh's Guide to the On-Line Universe*. Andy Ihnatko is also a longtime activist with BCS•Mac. They're ready to answer your questions

about everything Macintosh.

Write to Help Folder, c/o MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404.

Don't want to wait for an answer? Post your question on ZiffNet/Mac, MacUser's

on-line service, and get a reply from Bob (76004,2076), Andy (72511,204), or one of the other MacUser experts. See the masthead in this issue for instructions on how to sign up.

By Bob LeVitus and Andy Ihnatko

**Bob:** Last July (Help Folder, page 237) Barbara Freedman asked if it was possible to change the name of an open file. We said no, but it turns out that's not entirely correct. Many applications don't let you, including Word and WriteNow, which ask you to save the file under a different name after you've changed its name in the Finder. But other programs, including ClarisWorks and PageMaker, allow you to change the name of an open file to your heart's content and continue working. Then there are programs such as Photoshop, Painter, Canvas, Nisus, and Excel, which allow you to change the name of an open file in the Finder; they then automatically create a new file under the old name the next time you save, leaving you with two files instead of one.

### Safe Sleeping and X-Raying

**Q.** I am confused about two aspects of my PowerBook:

First, when is it all right to use the Sleep mode? The Apple manuals say to use Shut Down when transporting

PowerBooks, yet the article "Traveling Companions: PowerBook Utilities," (May '93, page 90) suggests putting the PowerBook into Sleep mode when going through airport security.

And second, what is the deal with airport X-ray scanners? Is it safe for my PowerBook to go through them or not?

John D. Roberts  
Altadena, CA

**Bob:** Apple is concerned that if you bump your PowerBook and the bumping moves a key on the keyboard just enough to awaken it from its sleep and your hard disk spins up and you jar your PowerBook just the wrong way while the disk is spinning, you *might* damage the hard disk. That scenario is possible but, in my experience, unlikely. My PowerBook has slept on planes, trains, automobiles, and even a boat, and nothing remotely like that has ever happened.

I don't provide potentially dangerous advice cavalierly, so I checked two authoritative sources: Richard Wolfson and Sharon Zardetto

Aker's excellent second edition of *The PowerBook Companion* (Reading, Massachusetts: Addison-Wesley, 1992) and Andy Gore and Mitch Ratcliffe's equally excellent *PowerBook: The Digital Nomad's Guide* (New York: Random House, 1993). They seem to agree with me. Wolfson and Aker call Apple's advice "extremely conservative"; Gore and Ratcliffe are more assertive, calling the potential danger "one of the great myths in the PowerBook user community."

As far as X-ray machines go, both of these books agree that there's little danger to your PowerBook, although putting it through one of these machines does pose a definite danger to floppy disks. X rays aren't the problem — they won't harm your PowerBook or your floppy disks, as we've said in this column several times in the past. The real danger is from the electromagnetic field (EMF) emitted by the magnets in the conveyor belt's motor. Again, most PowerBook users I know put their PowerBooks through the X-ray machine, and I've never

### \*... But Were Afraid to Ask

Got a simple question? I mean a really, deeply stupid question you don't want to ask anyone you know? If so, you've come to the right place, so send it on in. To protect your anonymity, we'll say it was sent in by a recipient of a MacArthur genius grant.

**Q.** You won't get a simpler question than this: I've lost my Iliac's user manual and need a new one. You wouldn't think this was a big problem, but it's stymied my local Apple dealer, who claims Apple doesn't sell manuals by themselves.

James Randi  
The Spirit Plane

**Andy:** Your friendly local Apple dealer is full of beans. Any dealer can special-order replacement manuals for all current Apple equipment. If your Mac is hopelessly out-of-

date, give the Apple Catalog people a call at 800-795-1000 (in the U.S. only). Among the Apple T-shirts, Apple golf umbrellas, Apple sailboards, and other such computing essentials, you'll also find manuals for just about everything Apple has sold since Reagan took office.

If the equipment is *really* ancient, however, your only course will be to check out flea markets and classified ads. I'm sort of in the same situation myself. For years, I've been looking for a copy of *The Red Book*, the manual for the first Apple, written by Woz himself. Any leads on this morsel would be keenly appreciated: You can contact me via MacUser, 950 Tower Lane, 18th Floor, Foster City, CA 94404 or at my CompuServe address (72511,204).



heard of a problem. You can limit the amount of EMF your PowerBook is exposed to by placing it in the center of the conveyor belt and as close to the scanner-tunnel entrance as possible.

The metal detector you walk through is more likely to cause problems than the X-ray machine, because most metal detectors use a strong electromagnetic field to detect metal. So if you decide not to send your PowerBook through the X-ray machine, for Pete's sake, don't carry it through the metal detector either. Pass it *around* the metal detector, and ask the security person to hand-check it. Metal detectors are even more perilous to your floppies, so have them hand-checked as well. For extra protection, I carry my floppies in a lead-shielded disk wallet.

## Mojo Memory

**Q.** Every chart I've seen swears the Quadra 700 cannot use 2-megabyte SIMMs to get a full 12 megabytes of RAM (4 megabytes on the motherboard plus four 2-megabyte SIMMs). However, I have a friend with a Quadra 700 who swears he has 12 megabytes with such a configuration on his machine. I haven't seen it, but how can this be?

William Henry  
Houston, TX

**Bob:** "Wild" Bill Ross, my

liveware consultant at Technology Works (which makes RAM upgrades), confirms that 2-megabyte SIMMs don't work "reliably" in a Quadra 700. He wouldn't sell 'em to you. If I were you, I wouldn't try it.

**Andy:** Speaking of Technology Works, to solve future memory questions, give them a call at 800-395-0726 or 512-794-8533 and ask for the free Macintosh Memory Configurations Chart and Calendar (see Figure 1).

Complete and informative, it not only tells you how much memory your Macintosh can use but also covers up water stains in the wallpaper very nicely.

## The Mac Unplugged

**Q.** We all know the rule about not plugging in or unplugging devices while the Macintosh is on, but I've never met a technician who seemed to pay any attention to this rule, particularly while "rearranging" an AppleTalk network. Just how dangerous is this?

Eric F. Fiedler  
via ZiffNet/Mac

**Bob:** Thou shalt not do what technicians do (unless, of course, you have AppleCare service contracts for all the products you're doing it to). Technicians are a breed apart—they have a large pile of spare parts at their disposal, so if they fry a component,

they reach into the pile and replace it. You, on the other hand, would have to take your damaged equipment to a dealer, whose mission in life is to charge you an arm and a leg to replace it. Even though you'll get away with it 999 times out of 1,000, that one time will cost you, and probably a lot. Is it worth it?

My advice? Never plug in or unplug anything while your Mac is powered up. Period. There, I've said it. Now if you do fry something, it's not my fault.

**Andy:** I want all of you to close your eyes for a moment and imagine that I'm removing the propeller beanie denoting my status as An Authority and am now donning the brown-felt fedora of Just Plain Andy. Just Plain Andy says that as long as you're not monkeying with the SCSI cable (which delivers mucho current and is in a sensitive location) or an ADB connector, you're almost certainly not taking any serious risks. You'd have to be a loser of the caliber of George Costanza to do any damage by unplugging a monitor cable. A modem or printer cable, even when there's no activity therein, presents a little more danger. Just be sure to unplug by the book — firmly grasp the connector, and then pull straight out.

Now I'm putting my beanie back on. Most of the time, the

marginal savings in time and effort aren't worth the serious loss in time and dough you'll suffer if something goes wrong. So the bottom line is, it's up to you.

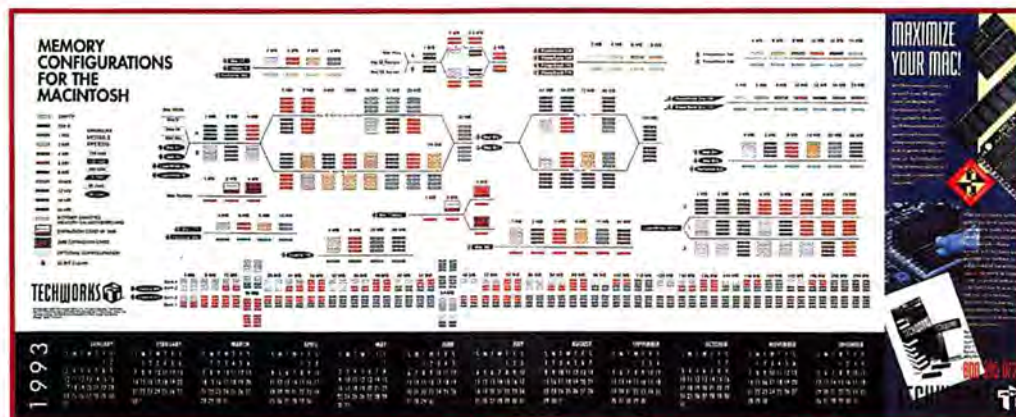
## Cursors, Foiled Again

**Q.** I've always wondered but never asked: Why does the cursor jump around when I print something?

Steve Shmerler  
Encino, CA

**Bob:** The reason for the herky-jerky cursor is print spooling, also known as background printing. Although your Macintosh allows you to get back to work after you've sent a job to the printer, it's processing that print job in the background, which inevitably degrades the performance of whatever you're doing in the foreground. And that's why the cursor twitches.

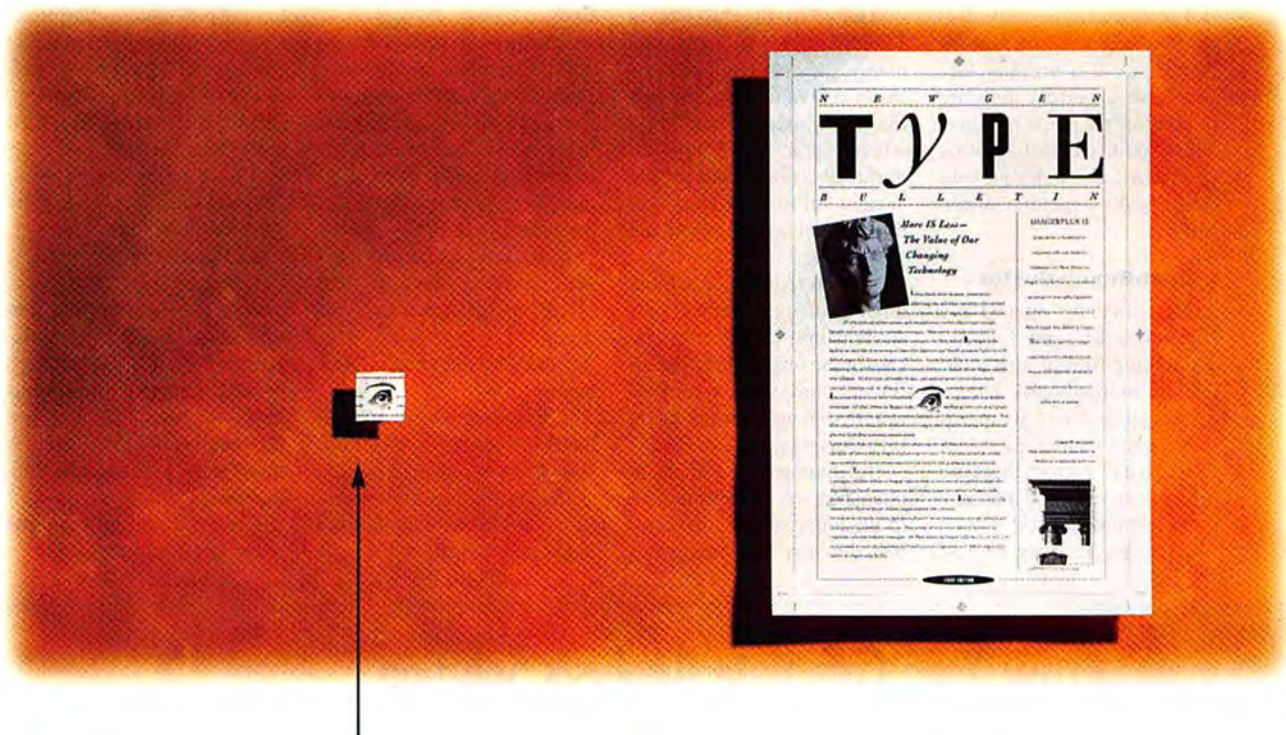
A couple of things will minimize (but not eliminate) the jumpiness of the cursor. First, if you're still using System 6, background printing will be somewhat smoother under MultiFinder. (You might have to increase the size of your system heap with a utility such as BootMan or HeapFixer if you're printing large documents.) If you find the quaking cursor bothersome enough, you might try SuperLaserSpool, a print spooler that seems to have less impact on foreground performance than the system



**Figure 1: If you don't know how much RAM or what kind of SIMMs your Mac can use, you're not alone — it's a subject fraught with confusion. One easy reference is a free wall calendar from memory vendor Technology Works.**



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software's built-in spooling.

**Andy:** I'd like to take this opportunity to say that I almost never, ever use print spooling. The performance hit is a big pain in the neck. Besides, when your Macintosh is tied up in a printing job, you have a perfect mandate to goof off for a few minutes. This is quite cleansing for the soul, and it also helps prevent those pesky repetitive-strain injuries.

#### Dust-Bunny Busters

**Q.** I recently opened my Macintosh LC and found a disquieting film of dust coating the motherboard. I keep my Macintosh and its monitor covered when they're not in use, but of course, there are long hours when the machine is on without a cover.

Is there any way to dust

the interior of my Macintosh without damaging its components?

A. B. Thompson  
Lexington, KY

**Andy:** Oh, the dust stories I could tell you. Unfortunately, the only one that's actually relevant is the story of the early Macintosh IIcx, where Apple made the wonderful decision to design the system fan to blow right into the hard drive to help cool the sucker off.

The fan also served to blow all of an office's ambient dust straight into the mechanism, causing several atomic breakdowns and waves of disgruntled owners marching on into Cupertino.

If I happen to have a lid open and see something akin to the lunar surface therein, I just don my antistatic wrist

strap (very important, in this case) and vacuum the interior, using the vacuum cleaner's brush attachment. Of course, I unplug the Mac first.

But the key here is not to get too excited about dust. Dust doesn't do much damage unless it's thick and has been there a long time.

Besides, it adds a lot of atmosphere to the office, if I may say so.

**Bob:** I use a can of compressed air to blow the dust off my circuit boards every so often.

But I like the vacuum idea even better.

The next time my Macintosh is in pieces on the floor, I'm going to try sucking the crud into my vacuum cleaner instead of blowing it onto my black sweatshirt.

#### Party of the First Part

**Q.** The answer to this question is probably so obvious that I'd prefer being referred to as some obscure Mesopotamian potentate's charioteer. For years I've been reading the phrase "third-party vendor" or "third-party supplier." Presumably Apple is the "first party" implied in this phrase. But I've never been able to figure out who the heck the "second party" is.

Norman Kehr  
Chicago, IL

**Bob:** Sorry, Norman, but that's not quite BWATA material. I've often wondered myself who that mysterious "second party" is. I asked around, and the consensus is that the second party is you, the user.

(And you're right — Apple is the first party.)

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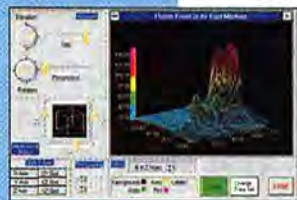
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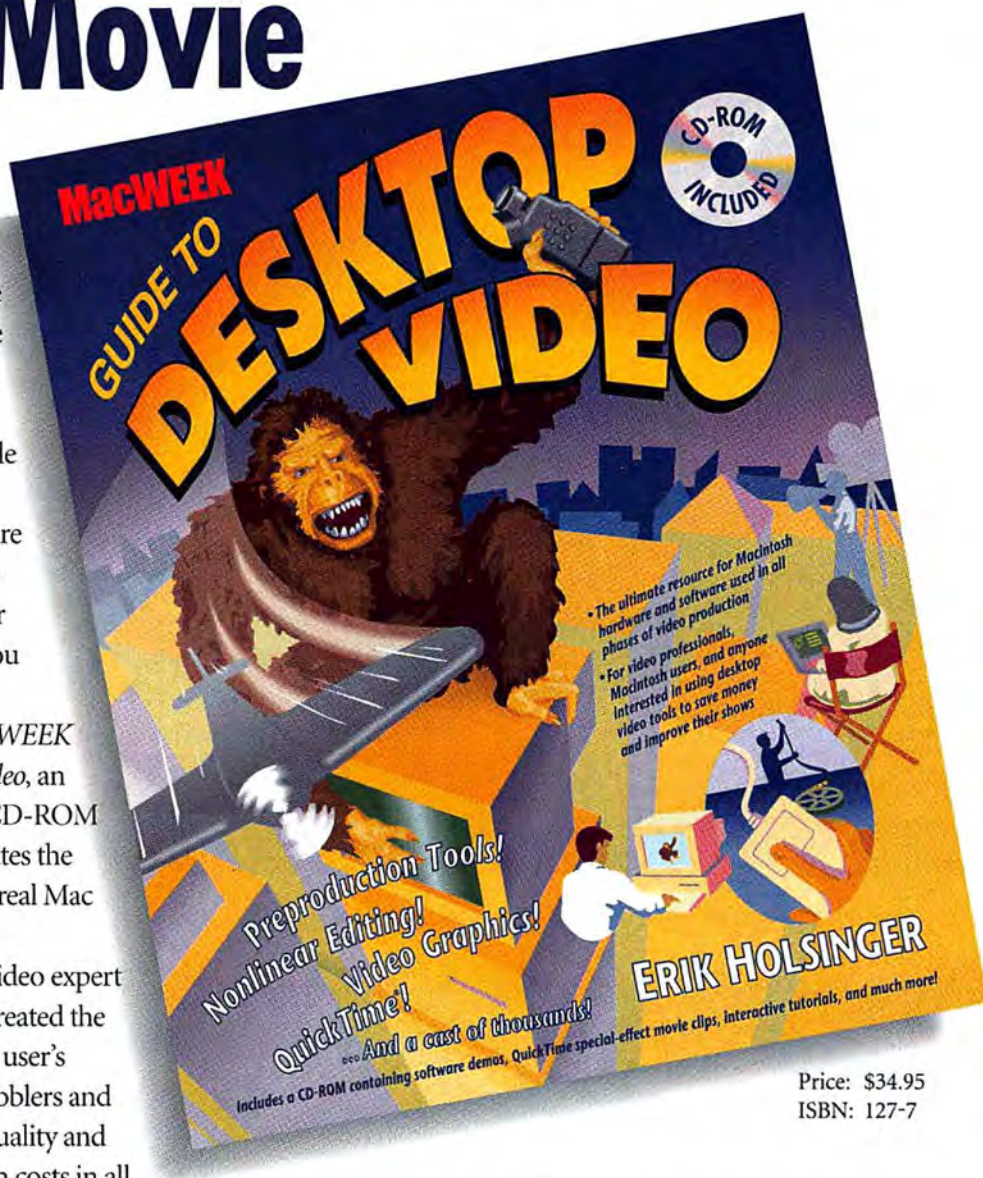
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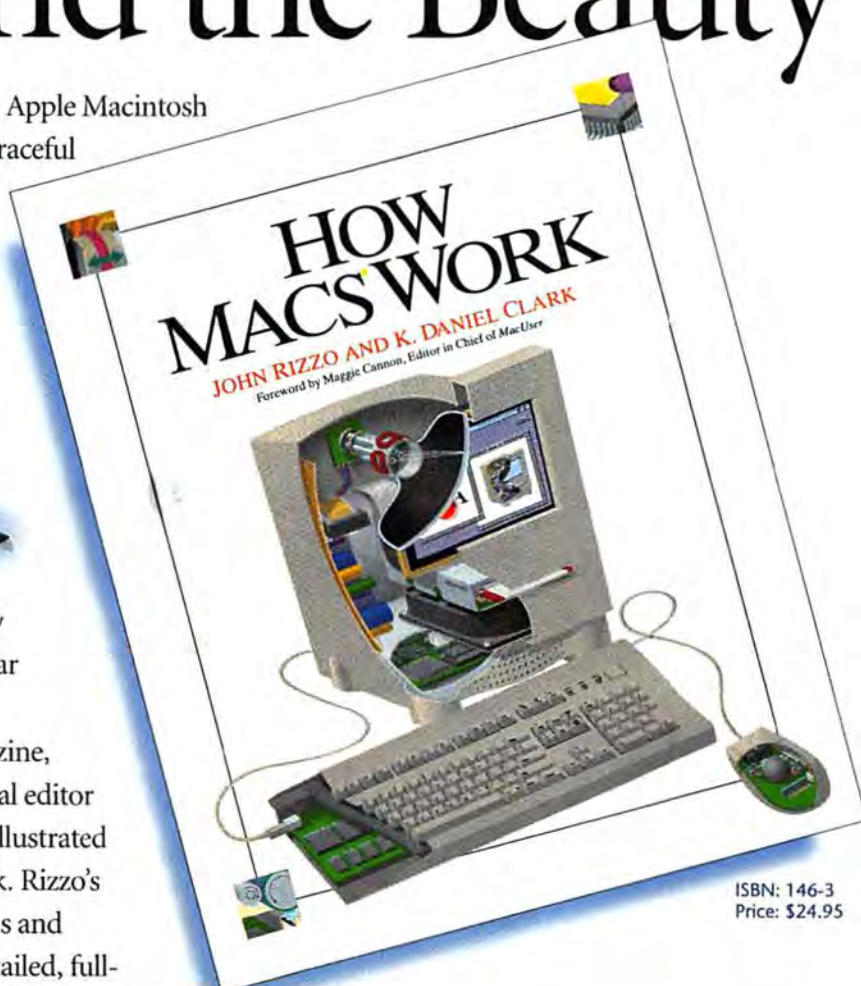
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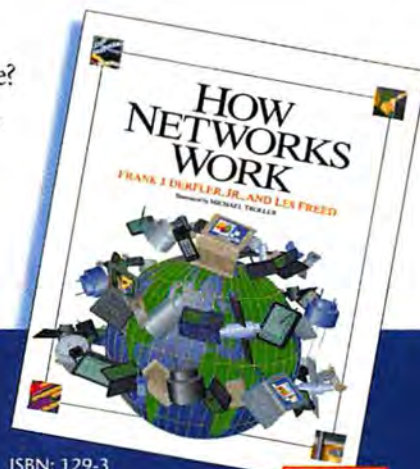
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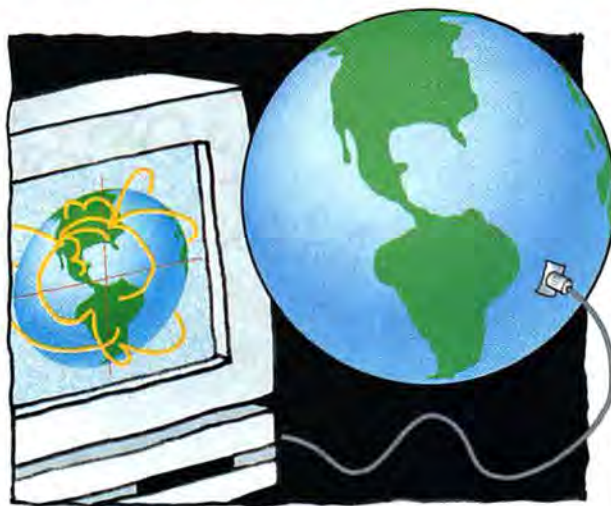
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### Meet the Internet

For an eye-catching, interactive introduction to the Internet provides, check out **A Cruise of the Internet** (CRUISE.SIT, Library 7), a multimedia tutorial produced by Merit Network. The presentation discusses many Internet services and gives examples of how to use them. It also lists more than a dozen Internet treasures, which offer information on everything from NASA to cooking.

To find out how to get onto the Internet, check out the **Nixpub List** (NIXPUB.SIT, Library 7) and the **PDIAL List** (PDIAL.SIT, Library 7), both of which list vendors that offer Internet access. More and more commercial sites are hooking up directly to the Internet as well, and free Internet access is available to college students and staff and



most academic and government employees.

Once you're connected, you'll find Brendan P. Kehoe's **Zen & the Art of the Internet** indispensable reading. Available in plain-text or printable-PostScript form (ZINTXT.SIT and ZINTPS.SIT, respectively, Library 7), *Zen & the Art of*


the Internet surveys the Internet's history, structure, and customs. This file also covers the basic Internet services in detail. It's worth reading for the etiquette tips alone.

### Internet Services

There are several ways to connect to the Internet, and most of them require you to

deal with the cryptic command-line interface of a UNIX mainframe. Shareware authors and public-spirited systems administrators have created applications that put a Mac front end onto the various Internet services, but many of these require special software such as Apple's TCP/IP Connection for Macintosh (formerly MacTCP); you can get details and technical advice in the Download & Support Forum.

One of the chief virtues of the Internet is that it allows you to send mail not only to any Internet site but also to many networks and bulletin boards and most on-line services. To put a Macintosh interface on the Internet mail you send, download **Eudora 1.3** (EUDORA.SEA, Library 1). For information on how to send mail back and forth between the Internet and other services, take a look at the **Inter-Network Mail Guide** (INMAIL.SIT, Library 7).

The Internet also provides a vast collection of downloadable files and documents, stored at countless Internet sites around the world. If you know where you're going, the shareware application **Fetch 2.1** (FETCH.SEA, Library 1) lets you browse a site in a Mac-like fashion. If you know what you want but not where to get it, you can use Internet's Gopher service to retrieve information and download files. The freeware **TurboGopher 1.0.6b5** (TURGOP.SEA, Library 1) makes Gopher a fast, friendly Mac client. 

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### SIMPLER SAVING

**Q**uickie Folder, this month's *MacUser* utility, remedies a glaring omission in the Mac interface: the lack of a New Folder button in the Save dialog box. Sure, it's been fixed by individual applications on a case-by-case basis, but many programs still suffer from this design flaw.

A streamlined, no-frills, solution-oriented extension, Quickie Folder does one thing and does it well: It places a New Folder button in every Save and Save As dialog box. It was created by popular *MacUser* utility programmer Mike Throckmorton, of Ann Arbor, Michigan (you can reach Mike on ZiffNet/Mac, at 72220,1611).

Quickie Folder is available exclusively on ZiffNet/Mac and from AppleLink's ZiffNet Selections. ZiffNet/Mac members can download Quickie Folder free of connect-time charges until October 25, 1993, by typing GO ZMC:POWERTOOLS. After that, you can find the file QFOLD.SIT in Library 3 of the MacUser Forum (GO ZMC:MACUSER). If you're on AppleLink, look for it in ZiffNet Selections:MacUser Software:Utilities.

By Mark Simmons



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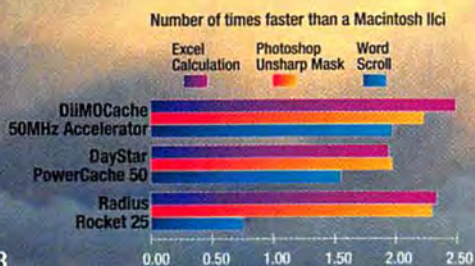
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\*\* The DiIMOCache 50MHz Accelerator design was formerly licensed to Logica Research, Inc. and marketed under the LogiCache™ brand name. In MacUser's April 1993 Accelerator Review, the DiIMO-designed accelerator received a 4 1/2 Mice rating out of 5 and was chosen as the Bottom Line Pick for the Mac IIsi and IIfx. DiIMO Technologies offers a 30-day money back guarantee, a five year warranty and toll-free tech support on all products.

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# Direct Line

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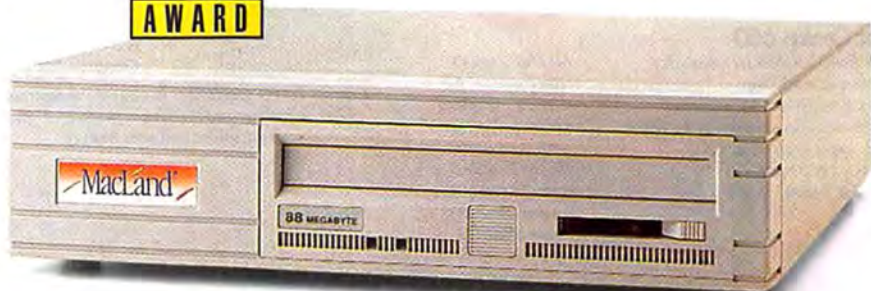
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Because they're removable and each data cartridge has a life of 30 years, you have virtually unlimited capacity for all of your storage needs.

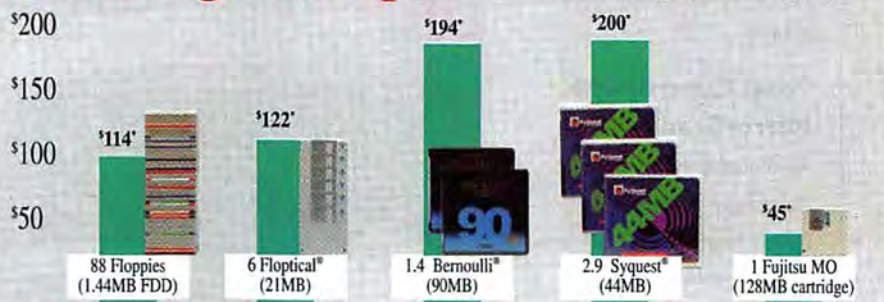
Buy now and we'll give you **ACTION! 2.5** Special Edition Multimedia Presentation Software, a \$495 value absolutely **FREE**. **ACTION!** – the leading presentation software package from Macromedia – is the perfect compliment to your DynaMO drive. Use **ACTION!** to create and deliver multimedia presentations with graphics, video, animation and sound.

DynaMO makes it easy to save these data-intensive presentations, and Insight makes it easy to buy.

Every Fujitsu DynaMO comes with a 30-Day "Worry-Free" Money-Back Guarantee, and a one year warranty from Fujitsu.

## The savings stack up.

To add 128MB of storage, you have to buy:



Plus, 128MB cartridges cost only \$45, which means you can dramatically increase storage for less than half a buck per megabyte. Or, take advantage of our special offer. Five 128MB cartridges including 109MB of **FREE** clip art are only \$199 – with the purchase of a Fujitsu DynaMO drive. That's over 600MB for 31 cents a megabyte!



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# FUJITSU



Call 24 hours.

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Improving the scanner that MacWorld Magazine<sup>1</sup> called "the best value around" and that Byte Magazine<sup>2</sup> called their "top pick" took some help from our friends.



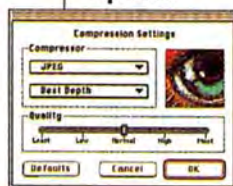
## QuickTime Savvy

QuickTime is the centerpiece of Apple's imaging technology.

Mirror recognized that no new scanner would be complete without leveraging this powerful new tool.

Introducing the world's first QuickTime-savvy color scanners.

**Stop wasting disk space!**



By using QuickTime's JPEG compression, images scanned

on your new Mirror scanner can be saved at 1/50th their normal file size!<sup>3</sup> Images that used to fill up a \$75 cartridge can now fit on a diskette that costs under a buck.

## Total Control with MirrorScan™

To control this hot new technology we created MirrorScan, which combines full-color previews (high or low rez), white/black point tools, custom selection options and integrated JPEG compression. Whether you use the application, desk accessory or Plug-in, you get stunning scans every time, in a powerful, easy-to-use package.

# IT TOOK A LITTLE HELP FROM APPLE TO MAKE A SCANNER THIS GREAT.

Mirror Scanner from **\$1099** with Photoshop

Now includes Read-It OCR software **FREE!**



## Choose 600 or 800 dpi

We improved our top-rated 600 dpi scanner by adding dual SCSI ports, hardware gamma correction, and an optional transparency adapter. There's also an 800 dpi version that incorporates the same great features for just a few dollars more.

Mirror Scanners	600 dpi	800 dpi
w/ MirrorScan & Photoshop	\$1099	\$1299
w/ Pro JPEG option & Photoshop	\$1499*	\$1699*
Transparency Option	\$ 599	\$ 599
All scanners include Photoshop 2.5 and Read-It 3.0!		

## Transparencies or Flat-art!

With the optional transparency adapter, either Mirror Color Scanner can accept transparencies up to 8½ x 11" (the competition only does 5 x 7). Perfect for desktop publishing systems.

## No Dealer Markup

It's one thing to design a scanner with more features and performance than anyone else. But delivering them without dealer markup, at savings of up to 40% makes them unquestionably the best value on the market.

All Mirror products include lifetime technical support and are backed by our 30-day "love it or return it" satisfaction guarantee.

<sup>1</sup>April 1992, <sup>2</sup>July 1992, <sup>3</sup>Requires an available NuBus slot.  
\*Compression rates vary, depending on quality settings.  
All prices subject to change.  
Prices are for US orders only, call for international pricing.  
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Media 1056



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Set your creativity free with this fantastic deal from NEC! When you buy a MultiSync 6FG 21" monitor and a MacFG 24X Color Card, you can get NEC's best MultiSpin 74 CD-ROM Drive FREE. The MultiSync 6FG's 21" screen displays dual-page WYSIWYG with exceptional clarity, brightness, and uniquely brilliant color. The MacFG 24X Color Card is specially designed for use with MultiSync FG monitors. It supports six resolutions up to 1152 x 870 at 24-bit color with QuickDraw acceleration. And your FREE MultiSpin 74 CD-ROM Drive is the top of the line with all the speed you need for smooth motion video. Hurry, offer expires December 31, 1993.

NEC

6674/6675 MultiSync 6FG Monitor, 24X Color Card, & Free MultiSpin 74 CD-ROM Drive

\*FREE CD-ROM coupon available by fax at 800-366-0476. Ask for document #23.

**NEC**

**\$36.**

## ZOA: The Zone of Avoidance

You are the lone defender of a remote space station under relentless attack. So jump in your fighter and have at it! Use your state-of-the-art controls to locate incoming raiders. Clear the sky of bad guys and re-dock at your space station for missiles and fuel. Realistic 3D graphics and high-voltage sounds add excitement to this flight simulation.

Minimum requirements: Mac Plus (LC recommended), 2MB RAM, System 6.0.2, 4MB RAM for color.

Casady & Greene

6907 ZOA: The Zone of Avoidance

**CASADY & GREENE**

**\$134.**



## IntelliDraw 2.0

High-powered drawing tools help you create and quickly refine the accurate graphics you need every day - at a price you can afford. Even if you don't draw, Smart Templates give you a head start. Use IntelliDraw for technical drawing, business or engineering graphics, diagramming, drafting, space planning, and more.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5, hard disk.

Aldus

6897 IntelliDraw 2.0

**ALDUS**

**\$48.**

## CD-ROM ToolKit

If you work with multimedia, clip art, reference works, or databases, CD-ROM ToolKit will improve their performance and your productivity. This utility replaces your CD-ROM drive's original software, transparently speeding up CD-ROM operations up to 1000 percent. This specialized software works in the background to accelerate all CD-ROM drives, even the faster multi-speed devices. It also improves compatibility and allows you to play audio CDs. There are no boards, cables, or cards to install. The program transparently caches CD-ROM information to your hard disk so mounting, folder opening, seeks, and searches happen instantly.

FWB

5731 CD-ROM ToolKit

**FWB**  
incorporated

**\$234.**

## ACCURA 144+ FAX 144

Looking for a high-performance data and fax modem for your Mac? The ACCURA 144+ FAX144 is a cost-efficient V.32bis/14,400 bps data communications and Group 3/14,400 bps fax modem. It supports standard 14,400-300 bps data transmission and provides 14,400-2400 Group 3 send and receive fax capability. High-performance V.42/V.42bis, MNP 5 error-control, and data compression protect your data and improve accuracy. Throughput is up to 57,600 bps using V.42bis data compression. Best of all, you'll be up and running fast with Smartcom data and fax software FREE (\$128 value)!

Minimum requirements: MacPlus, 1MB RAM.

Hayes

6068 ACCURA 144+ FAX 144

**Hayes**

**\$89.**

## QuickFLIX

QuickFLIX is the first, inexpensive movie-making tool for Mac users. It makes the production of QuickTime movies more affordable. And it's got the power to build video for business presentations, educational uses, CD-ROMs, or just for fun. QuickFLIX has all the software tools you need to produce your own movies including digitizing, editing, basic special effects, sound editing, titling, layering, and motion control. All in a familiar Macintosh interface. This program can even use Apple's new speech recognition technology, so you can speak to edit your movies if you've got a new Quadra 840av or Centris 660av. Don't doom another vacation's memories to a dusty collection of unedited VHS tapes. Get QuickFLIX.

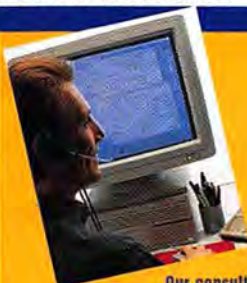
Minimum requirements: Mac II, 3MB RAM, System 7, a hard disk.

VideoFusion

6784 QuickFLIX



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PERSONAL MOVIE MAKING SOFTWARE



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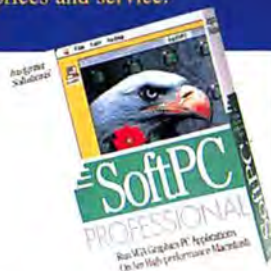
## SoftPC Professional

Do the PC one better by bringing PC applications to your Mac! There's no need to add hardware. With SoftPC, software does it all. SoftPC Professional 3.0 emulates VGA graphics giving you 256 colors and increased monitor resolutions to show crisp, realistic, and vibrant graphics. It emulates an 80286 processor and an Intel 80287 math coprocessor. Run protected-mode MS-DOS applications which have been written to utilize extended memory. MS-DOS 5.0 is pre-installed. And Microsoft CD-ROM extensions are also included, which means you can run PC CD-ROMs with your Mac CD-ROM drive. Plus, you can easily copy and paste text and graphics between PC and Mac applications.

Minimum requirements: SE/30, 8MB RAM, System 6.0, 6MB hard drive space.

Insignia Solutions

5925 SoftPC Professional



# \$59.

## Virex 4.0

Virex 4.0 is the ultimate weapon against the threat of Macintosh computer viruses. The application detects and repairs files infected by all known Macintosh viruses. The Record/Scan feature lets you identify previously unknown viruses. The Virex INIT program continuously monitors the computer to prevent future infections, and Virex is the only anti-virus product with an INIT that performs instant repairs!

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.2.

Data Watch

5234 Virex 4.0



# \$36.

## Crystal Crazy

This sequel to Crystal Quest has more crystals to collect, pool balls to sink, jigsaws to complete, and fragile ornaments to smash. Accomplish these entirely pointless tasks while avoiding eggs that hatch into space bunnies and much more. You'll be appalled at how much time you'll waste on this game - but you'll love every minute of it.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.2, hard drive, 4MB RAM for color.

Casady & Greene

5956 Crystal Crazy



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**CAESAR** METROPOLIS  
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## Art Fonts & Cool Fonts Bundle

Get 33 fantastic, artistic fonts with this bundle. Your documents will stand out from the crowd when you use these original, award-winning, attention-grabbing display font designs that clearly turn heads and make people pause. These fonts offer designers, artists, and desktop publishers striking new typefaces at an extremely low cost. And you can fully customize all of them with programs such as Typestyler or Adobe Illustrator. Both Type 1 and TrueType formats are included, all fully compatible with ATM and System 6 or 7. Art Fonts received the "Most Distinctive Font" award from MacUser.

Olduvai

6894 Art Fonts & Cool Fonts Bundle



# \$78.

MultiClip is a super-fast scrapbook/clipboard replacement that lets you have multiple clipboards and scrapbooks to save time and effort. Back-up everything you cut or copy, and even crop and edit your clippings for a perfect fit. "You'll find MultiClip so fun, productive, and amazingly easy to use, you'll soon wonder how you ever managed to work without it," says Macworld.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.5.

Olduvai

6895 MultiClip



# \$36.

## Spaceway 2000

Test your intergalactic combat driving skills! Spaceway 2000 is a high-speed, alien-infested freeway. Watch out for Wall Creepers who crawl along the edge of the highway and fire at you, and Blockers who follow your movements like bad mimes and keep you from passing. Use laser cannons, automatic shields, smart bombs, and more to battle your way through.

Minimum requirements: Mac Plus (LC recommended), 2MB RAM, System 6.0.5, hard drive, 4MB RAM for color.

Casady & Greene

6906 Spaceway 2000



CAS DY & GREENE

# \$124.

Another Mac's Place Exclusive!

## Help! & Peace of Mind Bundle

Catch incompatibilities and problems affecting your Mac with this bundle available only from Mac's Place. Help! is great technical support. It not only analyzes systems and highlights potential problems, but it also suggests possible solutions to those problems. Help! collects information about your system configuration, compares it with a set of rules in its built-in knowledge base, displays the results on your screen, and lets you print out the report. And you can perform over 150 comprehensive hardware diagnostics with Peace of Mind. It provides a complete diagnostic test suite and a real hardware workout. Peace of Mind is ideal for testing your RAM, SCSI bus & disks, video processors, modem, mouse, floppy drive, clock, ROM, graphics cards, and more.

Minimum requirements: Mac Plus, 2MB RAM, System 6.0.5, a hard drive.

Teknosys/Polybus Systems Corporation

6557/6558 Help! & Peace of Mind Bundle



# \$449.

Turn any Mac or PC into a powerful multimedia presentation system. The TVator Pro is a small, lightweight, portable device that converts analog RGB/VGA to NTSC signals for flicker-free color output on big screen TV, RGB video, LCD projectors, and RGB/SVGA monitors. Includes cables, power adapter, utility disk, TV brightness controller, and user's manual.

Minimum requirements: LC II; LC III; Ivi; Centr; 610, 650; Quadra 700, 800, 900, 950; PowerBook 160, 165c, 180, 180c; TV with Composite Video or S-Video input.

Antec

6903 TVator Pro

# \$31.

## Shanghai II, The Dragon's Eye

Snap off matching pairs 'til you run out of tiles, run out of moves, or run out of time in Shanghai. And this version of the captivating strategy game gets even better. Dragon's Eye is a special challenge for superior Shanghai players. It's move against move, as one player seeks to complete the Dragon formation, the other to dismantle it. Play the computer or a friend.

Minimum Requirements: Mac Plus, 1MB RAM, System 6.0.5.

Activision

4342 Shanghai II, The Dragon's Eye



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### Star Trek: 25th Anniversary

Beam aboard the U.S.S. Enterprise and continue a quarter century of exploration. Star Trek: 25th Anniversary combines a realistic, 3D space-flight simulator with role-playing adventure. As James T. Kirk, you control phasers, photon torpedoes, shields, communications, and warp drives. Pilot the Enterprise through stunning, state-of-the-art, digitized model graphics. Come face-to-face with dozens of alien races. Scan and survey hundreds of fractally-generated worlds. Beam down with your landing party and interact with aliens and artifacts. Relive the historic TV show with the complete musical score featuring digitized sound effects from the series.

Minimum requirements: Any color Mac, 1.5MB RAM, System 6.0.7.

MacPlay

6847 Star Trek: 25th Anniversary



MACPLAY

**\$78.**

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### Transparent Language: Spanish 2.0

Learn a language by reading interesting literature. It's true. You'll learn by reading and understanding rather than by drill and memorization. "Does it work? Yes," writes Associated Press. Just place your cursor on any text you don't understand and instantly see the meaning, grammar, and more. You read real literature that grabs and holds your attention, all in the original Spanish. You also hear the stories on the included audio cassettes. Play the fabulous VOCABULOUS! to strengthen your vocabulary. Also new to version 2.0 are word review lists. Includes Transparent Language software, three stories in Spanish, a sample story in each additional language, and audio cassettes. Also available in French, German, Italian, or Latin.

Minimum Requirements: Mac 512K, System 6.0.

Transparent Language

4864 Spanish 2.0



TRANSPARENT  
LANGUAGE®

**\$29.**

### The Disney Collection Screen Saver

Delight in the magic of Disney with all your favorite Disney characters in this latest addition to the After Dark family! Enjoy over 15 fantastic sound-packed displays including the Sorcerer's Apprentice, The Little Mermaid, and 101 Dalmatians. This stand-alone product is After Dark-compatible and includes screen-locking password protection and System 1.0 to maximize performance.

Minimum Requirements: Mac Plus, 2MB RAM, System 6.0.4.

Berkeley Systems

6819 The Disney Collection



**\$34.**

### Mangia!

Draft your Mac into KP duty. Mangia! includes hundreds of recipes and you can add your own. Find recipes you can cook with the ingredients on hand. Zero in on recipes for their kid appeal, spiciness, and more. Choose a recipe, then easily adjust the ingredients for the number of servings you need. Plan a menu for a week, and Mangia! writes the shopping list for you.

Minimum requirements: Any Mac with 1MB RAM, System 6.0.5.

Upstill Software

6901 Mangia!



**\$34.**

### Axis The Gamecheater

It's a win-win situation with The Gamecheater, the world's first game utility. Your weaponry is superior and you are immortal. Axis The Gamecheater lets you override predefined game functions with assignable hot keys. Add time, lives, money, extra ammo or fuel, and jump to different play levels in your favorite games - whatever it takes to win.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.7.

Baseline

6896 Axis The Gamecheater



**\$37.**

### Pathways into Darkness

Continuous-motion, 3D, texture-mapped graphics have arrived on the Mac! You'll explore an ancient pyramid on your mission to save the world from a hostile alien demon. Explore miles of catacombs through a smooth-scrolling, first-person interface. Beautifully rendered graphics and active panning stereo sound combine to make Pathways into Darkness the closest thing to virtual reality without a helmet.

Minimum requirements: Any 256 or 8-bit color Mac, 2MB RAM, System 6.0.5, 5MB hard disk space.

Bungie

6639 Pathways into Darkness



**\$78.**

**New Price!**

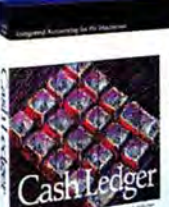
### Cash Ledger 2.0

This easy-to-use cash-based accounting program for managing personal and small business finance lets you record checks and deposits, reconcile bank accounts, keep track of vendors, create financial reports, and more. Pop-up lists make data entry fast and simple. Create recurring entries to save you from redundant typing. Each time you enter a transaction.

Minimum requirements: Any Mac with 1MB RAM, System 4.2, hard disk recommended.

Checkmark

1333 Cash Ledger 2.0



**\$49.**

### FLOWERScape

Plan your spring garden now with FLOWERScape! View its growth in color, as it would appear in any month of the year. Through its easy-to-use interface, FLOWERScape helps you choose what to grow and where to grow it. Just enter soil, sun, and geographic information, and the program recommends suitable plants. Includes FREE pH test strips.

Minimum requirements: Any Mac with a 256-color monitor and high-density floppy drive, 1.5MB RAM, System 6.0.4, 8.5MB hard disk space.

Voudette

6701 FLOWERScape-Mac (pictured)

6702 FLOWERScape-Windows ..... \$49.



**\$518.**

### Wacom 12" x 12" Tablet & Kai's Power Tools

Get the fabulous filter effects of Kai's Power Tools by HSC FREE with Wacom's new 12" x 12" tablet. This serial tablet has a square foot of working area, enough for serious computer artists to create masterpieces on their Macs. Wacom is the technology leader in graphics tablets and cordless, batteryless, pressure-sensitive pens. The 12" x 12" tablet offers you the most precise, delicate, real-time control possible over your graphic input - 120 levels of pressure. A menu strip adds flexibility by allowing you to define functions and macros. And this tablet includes a transparent protective overlay and enhanced control panel features.

Minimum requirements: Mac Plus.

Wacom

6898 12" x 12" UD-1212R Tablet with Stylus & Kai's Power Tools



**WACOM**

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Smart Label Printer Plus



## Smart Label Printer Plus

The Smart Label Printer Plus is a powerful enhancement to your computer – one capable of handling dozens of everyday tasks, saving you considerable time over setting up, formatting, and printing envelopes or labels on your regular printer. Create labels for envelopes, folders, Rolodex cards, and more. No more hand- or type-written envelopes. Print personalized labels or mailing lists from your applications. Use it right at your desk. The integrated software works as a desk accessory with WYSIWYG screens and background printing. Everything you need is included – label printer, software, power supply, printer cable, and a roll of labels.

Minimum requirements: Mac Plus, 1MB RAM, System 6.0.3.

## Smart Label Printer Pro

Produce fast, high-resolution, laser-quality output on multiple label sizes. The Smart Label Printer Pro prints at twice the resolution of other label printers. Using Seiko Instruments' latest and most advanced thermal print engine, the Pro can print text, POSTNET, bar codes, even photo-like graphics from digital images. Print labels for envelopes, file folders, ID badges, diskettes, binders, and more. The Smart Label Printer Pro comes complete and ready-to-use with printer, software, printer cable, power supply, and a roll of labels. Complete set-up takes only minutes. It's quick and quiet, printing labels in as little as six seconds. No ribbon, ink, or toner is required.

Minimum requirements: Mac Plus.

Part #	Description	Size	Price
For the SLP Pro and Plus Models			
6520	White Labels (2 rolls/box) 130 labels/roll	1 1/4 x 3 1/2	\$8.
6911	Clear Labels (2 rolls/box) 130 labels/roll	1 1/4 x 3 1/2	\$12.
For the SLP Pro only			
6912	White Labels (2 rolls/box) 260 labels/roll	1 1/4 x 3 1/2	\$12.
6913	Shipping Labels (1 roll/pk) 320 labels/roll	2 1/4 x 4	\$12.
6914	Disk Labels for 3.5" disks (1 roll/pk) 320 labels/roll	2 1/4 x 2 1/2	\$14.

Seiko Instruments

- 6154 Smart Label Printer Pro
- 5676 Smart Label Printer Plus

Color labels available!  
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SII  
Seiko Instruments

\$374.



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Mac DisplayLink.

## Mac DisplayLink w/Action

Beat the high cost of data display with an external computer link to video from Display Tech. When it comes to conventional monitors, VCRs, even video projectors, nothing works like Display Tech's "flicker-free" link to video. Just plug and play. You don't need any additional software. And it won't slow down graphics. Display any software package in real-time. Supports composite, S-Video, and 256 "flicker-free" colors.

Minimum requirements: Mac DisplayLink— Mac II with Apple 8.24 or compatible video card.

CVLink— LC, Performa, Centris, IIfx, Quadra, PowerBook.

Display Tech, Inc.

6875 Mac DisplayLink w/Action

6877 CVLink scan converter w/Action ..... \$559.



\$158.

## Lapis SCSI Dock

The Lapis SCSI Dock is the only way to add a SCSI port and an ADB port for under \$170. Connect your PowerBook Duo directly to any other Mac and operate in SCSI Disk Mode so that the Duo's hard disk appears on the Finder of the other Mac. You have fast access to information and file transfers. And the SCSI Dock weighs only five ounces, so it's a perfect portable solution. You can also connect your Duo to any SCSI device like a CD-ROM drive, second hard drive, or scanner. And the ADB port allows you to hook up a desktop mouse, trackball, keyboard, or tablet. Add flexibility to your Duo the affordable way.

Minimum requirements: PowerBook Duo 210 or 230.

Lapis

6849 Lapis SCSI Dock



## How to Order

- Call 1-800-817-0009 anywhere in the USA or Canada. Call 206-883-8312 for international orders.
- Fax your order to 1-800-881-3090. International fax orders: 206-881-3090.
- For electronic orders, use CompuServe (76635,660), GENIE (MACSPACE), or America Online (Mac'sPlace).
- Mac's Place is open from 6 a.m. to 10 p.m. M-F Pacific Time, and 7 a.m. to 6 p.m. on Sat., and 8 a.m. to 5 p.m. on Sun.
- No sales tax (except WA residents add 8.2% OH residents add 6%, to total, including shipping).
- VISA, MasterCard, Discover Card, American Express, OPTIMA, checks, and P.O.s gladly accepted.
- Your credit card is never charged until your product ships.
- All in-stock items ship same day, (barring system failure, etc.) to your doorstep, for just \$3 (USA) via Airborne Express overnight service. Rural locations may require an additional day for delivery. Areas not serviced by Airborne Express will be sent via Priority Mail.
- Our \$3 shipping charge includes insurance at no extra charge.
- When a partial order is shipped, we pay freight on

- additional shipments.
- Many products carry a money back guarantee (MBG).
- Defective software is replaced immediately with like items. Defective hardware items repaired or replaced at our discretion.
- We reserve the right to revoke money back guarantee privileges.

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- Call 206-883-8312 for our international sales line.
- Fax your order to 206-881-3090 for international orders.
- We ship throughout the free world.
- International orders will be charged full shipping rates plus insurance.

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\$278.

## ScreenLink Twin-Pak & SupraFAXModem 144PB

This is the perfect bundle for the telecommuter. With the ScreenLink Twin-PAK you can easily access your office Mac from home, and your home Mac from the office. Just dial in using your modem, and you've got complete control of your Mac. Use ScreenLink to check your e-mail, get an important file, or perform any other work on your remote Mac. The 144PB gives you 14,400 bps fax and data communications on a card that fits inside your PowerBook. Wake Up mode turns your PowerBook on when the modem receives a call and, when combined with the included fax software, can send scheduled faxes when rates are lowest.

Minimum requirements: Mac Plus, PB 100, 1MB RAM, System 7, 1.44MB floppy or hard drive.

Datawatch/Supra

6899/5575 ScreenLink & SupraFAXModem 144PB Bundle





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A Division of MacProducts USA

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258MB Cartridge	89.00
650MB Cartridge	99.00

## MACINTOSH SYSTEMS

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Quadra 840av 8/50	4775.00
Quadra 840 8/100 CD	4979.00
Quadra 840 8/1000	5479.00
PowerBook 180c 4/180	3899.00
PowerBook 230 4/120	2049.00
Centris 610av 8/230 CD	2599.00

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Upgrades!



## SYQUEST DRIVES

88C Removable Drive w/Cartridge 559.00

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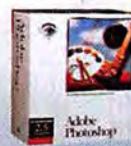
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“This is all the capability many designers will ever need. Its price/performance ratio makes it a package we must recommend.”  
*BYTE MAGAZINE*

DesignCAD for the Mac combines both 2D drafting and 3D modeling into one great package. Built from the ground up, not a port-over, DesignCAD offers Floating Point Precision. DesignCAD comes complete with: Isometric, perspective, and orthographic viewing; associative dimensioning; automatic scrolling; tolerance options; arrowhead choices, and much more!

Publisher: American Small Business  
CAD0043

**\$155<sup>95</sup>**

## TouchBase Pro/DateBook Pro Bundle

**NEW!** ALL NEW! The award winners just got better. TOUCHBASE and DATEBOOK have turned PRO! Now, a contact manager that provides power and ease of use, and a time manager that has the flexibility to track all your daily activities. With TOUCHBASE PRO, you can manage your contacts, dial your telephone, write letters, and print address books, labels, envelopes and fax covers. DATEBOOK PRO combines calendars, appointments, To Dos, alarms and reminders to keep you on time. Best of all, TOUCHBASE PRO and DATEBOOK PRO are completely integrated. Together they form the BEST in personal information management.

Publisher: Aldus BUS0299  
Also available: TouchBase Pro DAT0104 \$49<sup>95</sup> and DateBook Pro BUS0298 \$49<sup>95</sup>

**\$89<sup>95</sup>**



## MiniCad+4

MiniCad+4: An unsurpassed mix of ease of use and powerful features defines MiniCad+4. The award-winning MiniCad+ combines 2D CAD, true 3D CAD, a database/spreadsheet, programming language, intelligent interface and AutoCAD translator into one program. New features include 3D walkthrough and flyover tools, tolerancing, automatic roof, wall, and floor tools, and more. CAD0030 \$595<sup>95</sup>

## Blueprint 4\*

Blueprint 4 makes drafting and design easy for architects, engineers and illustrators. The new version 4 incorporates all the professional 2D features found in MiniCad+4. The price/performance ratio is absolutely unbeatable. Try it on Manufacturer's 30 day money-back guarantee!

CAD0024 \$219<sup>95</sup>  
Publisher: GraphSoft

**\$219<sup>95</sup>\***

## SoftPC Professional 3.1

Wouldn't it be great if you could run advanced DOS and NetWare programs on your Macintosh?  
Run DOS and NetWare Applications with VGA Graphics on Macintosh Computers. SoftPC is the software only solution that lets you run more than 50,000 standard or custom DOS applications on your Mac. SoftPC PROFESSIONAL runs PC programs which utilize VGA graphics and extended memory. SoftPC PROFESSIONAL has MS-DOS 5.0 pre-installed and is ready-to-run on your Mac.

Requires: Suitable for the MacII cx, ci, si, fx, PowerBook, Performas and all Quadra computers.

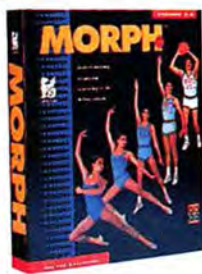
Publisher: Insignia Solutions  
COM0141

**\$179<sup>95</sup>**

## Morph 2.0

The hottest image effect of the nineties is now available on the Macintosh! Morph™ smoothly transforms one image into another, creating dazzling images and effects like turning last year's car model into this year's or a futuristic cyborg villain disguising itself as a valiant heroine. Morph™ is fast, easy-to-use, and is also QuickTime-savvy.

Publisher: Gryphon Software  
GRA0505



**\$165<sup>95</sup>**

## Language Explorer

Animate the discovery of language in English, French, German and Spanish. Languages are presented in 42 topics, with over 500 colorful, animated pictures. Simply select a topic and language, then match words to pictures. Five levels of difficulty add new challenges from the basic exploration of Beginner, to all languages and topics at the Polyglot level! All ages. Requires: Color Mac, System 6.0.7 or greater.

Publisher: Nordic Software  
EDU0490

**\$32<sup>95</sup>**



## SuperPaint 3.5

NEW! Aldus Super-Paint 3.5 combines the best of paint and draw packages for anything from the simplest business illustrations to sophisticated full-color art. New features: Copy Brush, Crop Mark, Grid, Magic Marker, and pressure sensitive tools, templates and more. GRA0503

## Personal Press 2.0

Aldus Personal Press 2.0 is page layout software that intelligently assembles your text and graphics automatically. Includes "Intelligent" templates, copy fitting, word processing, text wrap, free rotation, drawing tools.

DTP0080 Publisher: Aldus

**\$99<sup>95</sup> ea.**



## WristSaver or MousePad

The WristSaver cradles your wrist with a contoured neoprene rubber pad and a washable nylon covering. It's ergonomically designed to support your wrist at the proper angle to help avoid the pain associated with

Carpal Tunnel Syndrome. The WristSaver MousePad (8" x 9.5") provides a comfortable rest for your wrist, plus a conventional mouse pad. Simple finger movements replace sliding the entire arm or hand. Manufacturer: LB Innovators

ACC0560 WristSaver (Red)  
ACC0635 MousePad (Red)

Available in Gray, Black, Red or Navy. Please specify color.

**\$15<sup>95</sup> ea.**

## Star Trek 25th Anniversary

Pilot the famous U.S.S. Enterprise on a wild ride through the final frontier. This exciting game combines a realistic 3D space flight simulator with role-playing adventures featuring the Star Trek team. Control phasers, photon torpedoes, shields, communications, warp drives. Beam down to alien worlds. Come face-to-face with dozens of alien races. Complete with musical score and digitized sound effects.

Requires: Color Mac with 1500K free memory; System 6.0.7 or later. Publisher: MacPlay ENT0578

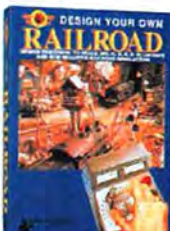


**\$35<sup>95</sup>**

## Design Your Own Railroad

Design Your Own Railroad enables you to design, build, and operate a model railroad on your Mac. Lay out the track using precision CAD tools. Draw scenery with a complete set of color drawing tools. Operation includes coupling and uncoupling, switching, pickup and delivery of loads with revenue tracking, and, of course, crashing! It's an indispensable tool for serious modelers, and fun for rail fans of all ages.

Requires: 1 MB memory; hard drive recommended. Publisher: Abacadata GRA0398



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Publisher: Knowledge Adventure



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## Eco-Adventures: In the Oceans

●Eco-Adventures: In the Oceans puts you aboard a research vessel to explore the Oceans of the World. Digitized sounds and full-color underwater images bring the aquatic plants and animals to life on your Mac.  
EDU0337



## Eco-Adventures: In the Rainforest

●This challenging game simulates the environment of a tropical rainforest. With the aid of a guide, maps, and equipment, you'll travel through the rainforest, experiencing the digitized sounds and full color images of endangered species.  
EDU0336

Both come with a FREE full color poster and require a hard disk & 2MB RAM.  
Publisher: Chariot Software

**\$35.95** ea.

## The Journeyman Project

●The Journeyman Project is an awesome time-travel adventure that brings you into the action with stunning photorealistic 3D worlds, true interactivity, and a non-linear plot. Set in the year 2518 when time travel is possible, your goal as an elite agent is to save history from sabotage.

Publisher: Presto Studios  
ENT0515



**\$65.95**

## FileGuard 2.7

●It's sleek, fast and safe. I highly recommend it. MacUser. Protect your hard drive, applications, files, and folders (including System Folder) from erasure, unauthorized access (including security bypass with a System diskette), deletion, and illegal copying. UT10135



**\$139.95**



## TrashGuard

●Delete files forever, with TrashGuard. Using the Trash Can to delete a file only makes the space available, but does not erase data. TrashGuard not only deletes files, it actually removes them from your hard disk. It even complies with D.O.D. standards! UT10322



you shut down your Mac. Backup your choice of files or folders, your entire hard disk or other mounted device.  
UT10323

Also available: Security Trio - Take Fileguard, Trashguard and FileDuo together and save!  
UT10423 \$149.95

## FileDuo

●Backup your important files quickly and automatically! FileDuo creates backups at any times you want: every 5 minutes, at a specific time, or when

**\$89.95**

## WindoWatch

●Keep track of how you are using your Macintosh. WindoWatch automatically generates a timesheet in the background, as you work. It can be set to track window or application usage. Use it to record time spent on a project, justify new hardware or software purchases, or document use of your Mac at home (for the IRS). WindoWatch operates entirely in the background, never interrupting normal use of your Mac.  
UT10264



**\$89.95**

## Wiz Tools

●These 9 powerful System 7 enhancement modules are jam-packed with helpful time savers. Modules include a synchronization and backup module, hierarchical menus, a keystroke recorder for registering your keyboard input all day long, a simple but effective folder watching system, a customizable clock for the Desktop, PowerBook utilities (including battery level indicator), direct access to frequently used items, new shortcuts for the Finder, and more... The powerful backup/synchronization module alone, makes this product a great value!  
UT10414



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Publisher: ASD Software

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●With Help!, you can clean up your configuration and improve your Mac's efficiency. The program analyzes your system using a knowledgebase of problem-solving information covering more than 3,300 products. Help! creates an easily understood report that describes



all problems detected and tells exactly how to solve them. Help! detects conflicts, incompatibilities, improperly installed files, environmental problems, damaged files, and duplicate files.

Publisher: Teknosys UT10251

Also available: Network version for Macintosh support personnel.

25-pack UT10393 \$329.95

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### Thunder 7 v.1.5.3



● Thunder 7 is the universal spellchecker that alerts you the instant you make a mistake, helping you fix it immediately—in any application. With features such as the

Shorthand Glossary which expands abbreviations automatically as you type and an on-line thesaurus, you keep your work looking professional. You'll find it indispensable!

Publisher:  
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Publishing  
SPL0029

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- Allsys**  
 ● FON0509 Fontographer 4.0 259.95
- Apple Computer, Inc.**  
 ● GRA0347 QuickTime Starter Kit 109.95
- Clarisc**  
 ● GRA0350 MacDraw Pro 1.5 275.95
- Cachet**  
 ● GRA0432 Electronics for Imaging (EFI) 299.95
- Dream Maker**  
 ● GRA0514 MacGallery II 27.95
- Fractal Design**  
 ● GRA0412 Painter 2.0 279.95
- Graphsoft**  
 ● CAD0024 BluePrint 4.0 219.95  
 ● CAD0030 MiniCad 4.0 595.95
- Gryphon Software**  
 ● GRA0505 Morph 2.0 165.95
- Quark, Inc.**  
 ● DTP0036 XPress 3.2 599
- Ray Dream**  
 ● GRA0383 addDepth 125.95
- Softkey Software**  
 ● FON0480 KeyFonTS 49.95

### INPUT & OUTPUT

- Apple Computer, Inc.**  
 ● ACC00921 LaserWriter Toner Cartridge 89.95  
 ● ACC00922 LaserWriter 250 Sheet Letter Cassette 72.95  
 ● ACC00923 LaserWriter II Letter Cassette 65.95
- Caere**  
 ● INP0289 OmniScan 399.95
- Datadesk International**  
 ● INP0174 Mac 101E Keyboard Platinum 129.95  
 ● INP0183 Mac 101E W/Keys 2 159.95
- Kensington**  
 ● INP0231 Turbo Mouse (SE or II) 4.0 109.95
- Microtek**  
 ● INP0246 Microtek ScanMaker II 899.95  
 ● INP0247 ScanMaker II XE 1199.95
- Mouse Systems**  
 ● INP0132 Little Mouse ADB 74.95

### Generic CADD 2.0

● Generic CADD 2.0 is a powerful computer-aided design for the Mac, running on everything from the Plus to the Quadra systems, including PowerBooks. With full CAD drawing and editing tools and sixteen decimal place precision and accuracy. Export/Import to AutoCAD and other CAD, CAE, and CAM programs via DXF. Publisher: AutoDesk CAD0042

**\$299<sup>95</sup>**

- SuperMac**  
 ● MCH0553 SuperMatch 20+ Color Display 1899.95
- UMAX**  
 ● INF0273 UC840 Color Scanner w/ Photoshop 1445.95  
 ● INF0287 UC630 Color Scanner w/ Photoshop LE 899.95

### POWERBOOK PRODUCTS

- Applied Engineering**  
 ● ACC0833 Automobile Power Adapter 69.95  
 ● ACC0834 Battery Charger 69.95
- Battery Technology Inc.**  
 ● ACC0840 Battery for Powerbook 59.95
- CMG Computer Products**  
 ● ACC0837 Powerlock Plus 49.95

### Virtus VR

● The Future is here! Virtual reality-Headsets? Goggles? Not anymore! Imagine the world of virtual reality on your desktop computer. This exciting package comes with its own set of 3D worlds: You control the

action-like a flight simulator or a movie that you direct. Changes are easy and take place in the blink of an eye. Virtus VR is powerful, easy to learn and simple to use.

Publisher: Virtus  
GRA0544

**\$65<sup>95</sup>**

### Fractal Design Painter X2

● Fractal Design Painter X2, an expert extension to Painter 2.0, revolutionizes the way artists and designers combine and orchestrate multiple graphic elements. With X2 any number of floating selections can be painted into, around or under; they may be scaled, rotated and distorted.

GRA0507 \$99<sup>95</sup>

### Fractal Design Painter 2.0\*

● Painter, the award winning 24-bit color, Natural-media™ painting program, now includes photo design features. New features include image retouching, color separations, font support, and much more. Perfect for artists or wannabes!

GRA0412 \$279<sup>95</sup>\*\*

Publisher:  
Fractal Design

**\$279<sup>95</sup>\***

### UD-1212R

Based on Wacom's legendary reputation for quality, the new UD-1212R tablet incorporates features never before available on a graphics tablet, such as: "auto pressure range control" for personalizing the pen to your exact feel, and the incredible multi-device feature: for having a pen and cursor working simultaneously on the tablet! These are just a few of the new features on this top-of-the-line Wacom tablet, and you get all this at a new low price!

Manufacturer: Wacom

INP0303



**NEW!**

**\$799<sup>95</sup>**

### GameCheater



● GameCheater is a control panel device that allows you to cheat at dozens of Mac games. Be undefeated! Conquer every adversary, every time! GameCheater works with all your favorites including

Prince of Persia, Hellcats over the Pacific and Spectre. Get GameCheater and you'll be invincible.

Publisher: Baseline Publishing  
ENT0556

**\$34<sup>95</sup>**

### Connectix

- UTI0297 CPU Connectix for Powerbook Utilities 55.95
- Kensington**  
 ● INP0221 Notebook Keypad 79.95
- Sophisticated Circuits**  
 ● INP0232 Powerpad 75.95

### UPGRADES & DRIVES

- Applied Engineering**  
 ● DRU0728 40 MHz LC Accelerator 399.95  
 ● DRU0731 25 MHz SE Accelerator 189.95  
 ● DRU0531 AFDH Plus Drive 299.95
- DayStar Digital**  
 ● Universal PowerCache 33 MHz 399.95  
 ● Universal PowerCache 33 MHz w/882 499.95  
 ● Universal PowerCache 40 MHz 589.95  
 ● Universal PowerCache 40 MHz w/882 699.95
- Mass MicroSystems**  
 ● DRU0253 DataPak 45MB Removable 499.95  
 ● DRU0719 3.5 in. 105 MB Syquest Drive 875.95  
 ● DRU0623 Data Pak 44/88C MB Removable 649.95
- Peripheral Land, Inc.**  
 ● DRU0375 Infinity 88 Removable single 599.95
- PowerUser®**  
 ● CHP0011 4 Meg SIMMs 80ns Call  
 ● CHP0013 1 Meg SIMMs 100ns Call  
 ● DRU0550 85 Meg Drive 329.95  
 ● DRU0494 Pro 105 MB Drive 389  
 ● BND0176 44/88C MB Syquest Removable 529  
 ● BND0094 44MB Syquest Removable 399  
 ● BND0095 88MB Syquest Removable 499.95
- SuperMac Technologies**  
 ● DRU0437 Spectrum/8 24 PDQ 599.95

### UTILITIES & PROGRAMMING

- Abbott Systems, Inc.**  
 ● UTI0113 CanOpener 2 59.95
- Aladdin Systems**  
 ● UTI0302 StuffIt Deluxe 3.0 69.95
- Apple Computer, Inc.**  
 ● SYS0004 System 7.1 Personal Upgrade Kit 79.95  
 ● SYS0010 AF Ease 2.0 45.95
- Binary Software**  
 ● UTI0348 Square One 49.95
- Caere**  
 ● UTI0293 OmniPage Direct 199.95  
 ● UTI0202 OmniPage Professional 649.95
- Kent Marsh, Ltd.**  
 ● UTI0212 FolderBolt 75.95
- MAXA Corporation**  
 ● UTI0353 Alert! 115.95
- MicroMat Computer Systems**  
 ● UTI0285 MacCKG 2.0 89.95
- Symantec Corporation**  
 ● UTI0151 Norton Utilities for the Mac 2.0 95.95  
 ● UTI0334 Symantec Antivirus for Mac 3.5 (SAM) 65.95

## MacWAREHOUSE®

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 ■ All orders add \$3.00 per order. We ship Airborne Express overnight unless UPS Ground delivers overnight. (Some rural areas require an extra day.)  
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1GB TOSHIBA  
FROM \$799!

## SPIN HIGH-SPEED/ HIGH-CAPACITY DRIVES



Our high capacity Spin Drives come with speed-demonstrable mechanisms from DEC, Seagate and Quantum. Check the chart at the right for blazing access times, and throughput rates. Available in Internal, Zero Footprint and Compact enclosures. (Compact pictured)

Spin/Toshiba MK-537 1 GB Drive (internal)	<b>\$799.00</b>
Spin/Quantum PD-1050 1 GB Drive (internal)	<b>\$899.00</b>
Spin/DEC DSP 3105 1 GB Drive (internal)	<b>\$999.00</b>

NEW!

## SPIN SYQUEST DRIVES



The latest in removable technology. It's small. But big. Small due to its Lilliputian footprint. Big because it accepts 3.5 inch media holding 105 Megs. Also the SyQuest 44/88 accepts both 44 MB and 88 MB media.

The Spin 3.5-inch SyQuest Drive w/cart.	<b>\$639.00</b>
SyQuest 5110C 44/88 SyQuest Drive w/cart.	<b>\$499.00</b>
SyQuest 88 MB Removable w/cart.	<b>\$449.00</b>
SyQuest 44 MB Removable w/cart.	<b>\$349.00</b>

## SPIN TOSHIBA XM 3401 CD ROM DRIVE



The Toshiba mechanism in this drive is double speed—in a word, whoosh, making the Spin CD ROM perfect for Photo CDs and MultiSession applications.

Toshiba Double Speed CD ROM Drive	<b>\$499.00</b>
The Double Spin CDR 84 CD ROM Drive	<b>\$449.00</b>

## SPIN 3.5 OPTICAL DRIVE



Small footprint. Small pricetag; under \$1000. It accepts ISO standard 128 MB capacity 3.5-inch cartridges compatible with other machines. Exclusive 2-yr warranty.

The Spin 3.5 Optical Drive w/cart.	<b>\$949.00</b>
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# GO FOR A SPIN WITHOUT BEING TAKEN FOR A RIDE.

### MORE THAN JUST A LOW PRICE.

Flip through these pages (not right now, it's just a figure of speech), and you'll see a lot of low prices. The difference with Spin is that you get more. And not just a little more. We include many free things that others charge you for. Like a double-shielded SCSI cable. External terminator. A power supply designed for constant use. Not to mention our own Spin Disk Utilities with free upgrades for a year, system software, and unlimited tech support as long as you own a Spin drive. We aim to please. Call one of the other guys and ask what they'll give you for free. The cardboard box? The owner's manual? Then call us back.

### 30 DAYS TO DECIDE.

If you're not satisfied, neither are we (we're referring, of course, to Macintosh peripherals only). That's why every Spin product comes with a 30-day money back guarantee. Test-drive any Spin product. Give it a real workout. If you're not happy, return it within 30 days for a refund.

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## THE LOWEST MEDIA PRICES ANYWHERE



SyQuest unformatted 44 MB	<b>\$58.99</b>
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SyQuest formatted 88 MB	<b>\$105.00</b>
SyQuest 105 MB 3.5-inch cartridge	<b>\$58.99</b>
Optical 3.5-inch cartridge	<b>\$35.00</b>
DAT 90 meter (4mm) Tape Cassette	<b>\$17.00</b>

## SPIN DAT MFG DRIVES



If it's your job to archive a ton of files, choose one of our Spin DATs. Standard DAT holds 2 GB. Compression model, up to 8 GB. Includes DANTZ Retrospect™, version 2.0

Spin Standard DAT	<b>\$999.00</b>
Spin Compression DAT	<b>\$1199.00</b>

## ZERO FOOTPRINT DRIVES



There's a Spin Zero Footprint drive for every application. They include everything you need to get up and running. Check this chart for specs and prices.

Capacity (MB)	Model Number	Ax. Acc. Time (msec)	Transfer rate (K/sec)	MFG warranty (mos)	Int. Drive Price	Zero FP Drive Price	Compact Drive Price
Quantum	ELS 85S	17	1800	24	\$179	\$229	-
	ELS 127S	17	1800	24	\$189	\$239	-
	ELS 170S	17	2000	24	\$199	\$249	-
	LPS 240S	16	2300	24	\$259	\$319	-
	LPS 525S	16	2300	24	\$599	\$649	\$749
	PD-122S	10	2700	24	\$999	\$1,049	\$1,099
	PD 1800S	10	3000	24	\$1,399	\$1,449	\$1,499
	GO 120 (pwrbk)	17	1900	12	\$259	-	-
	DSP-3210	9.5	3600	60	\$2,099	-	\$2,149
	ST-11200N	10.5	3200	60	\$999	\$1,049	\$1,099
Seagate	Barracuda	8	4500	60	\$2,249	-	\$2,349
	MK-538	12.5	2600	36	\$999	\$1,049	\$1,099
	MK-2224	12	1800	12	\$499	-	-
Toshiba	MK-2236	12	1800	12	\$649	-	-

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# Quantum



## GO•DRIVE SERIES

2.5" POWERBOOK DRIVES

Capacity	Access	Internal	External
80mb	17ms	\$209	\$309
120mb	17ms	\$265	\$365
160mb	17ms	\$279	\$379

## ELS SERIES

3.5" LOW PROFILE, LOW POWER

Capacity	Access	Internal	External
42mb	19ms	\$105	\$165
85mb	17ms	\$164	\$224
127mb	17ms	\$188	\$248
170mb	17ms	\$194	\$254

## LPS SERIES

3.5" LOW PROFILE

Capacity	Access	Internal	External
240mb	10ms	\$255	\$315
525mb	10ms	\$629	\$689

## PRODRIVE SERIES

3.5" HALF HEIGHT

Capacity	Access	Internal	External
425mb	9ms	\$499	\$659
700mb	10ms	\$799	\$859
1.0GIG	10ms	\$899	\$959
1.2GIG	10ms	\$999	\$1059

Quantum LPS, ELS and PRO drives carry a TWO Year Warranty. Quantum GO•DRIVES carry a ONE Year Warranty.

\* One Year Warranty

**FIVE YEAR WARRANTY**

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
230mb*	M2637	2.5" Low Profile	15ms	220mb	\$499	\$599
520mb	M2624	3.5" Half Height	9ms	496mb	\$631	\$691
1.2GIG	M2694	3.5" Half Height	8.5ms	995mb	\$976	\$1036
2.4GIG	M2654	5.25" Full Height	11.5ms	2000mb	\$1715	\$1815

Unformatted Capacity	Model	Description	Access Time	Actual MAC Capacity	Internal	External
<b>3.5" HALF HEIGHT</b>						
1.2GIG	ST11200N		10.5ms	1000mb	\$919	\$979
2.4GIG	ST12400N		9ms	2000mb	\$1979	\$2039
1.9GIG	ST11950N	Barracuda 1	8ms	1350mb	\$1799	\$1859
2.4GIG	ST12550N	Barracuda 2	8ms	2050mb	\$2239	\$2299
<b>5.25" FULL HEIGHT</b>						
1.6GIG	ST41651N	Wren-8	15ms	1350mb	\$1269	\$1369
2.1GIG	ST42100N	Wren-9	12.9ms	1900mb	\$1435	\$1535
2.4GIG	ST42400N	Elite-2	11ms	2050mb	\$1785	\$1885
3.4GIG	ST43400N	Elite-3	11ms	2750mb	\$2265	\$2365

Seagate drives carry a ONE Year Warranty.

## CLUBMAC TAPE BACKUP SYSTEMS

**FREE** RETROSPECT V2.0 BACKUP SOFTWARE

Capacity	Model	Media	Internal	External
<b>TAPE BACKUP SYSTEMS</b>				
155mb	Teac MT25T/N50	CT600N	\$429	\$449
600mb	Teac MT25T/F50	CT600F	\$629	\$649
<b>DAT TAPE BACKUP SYSTEMS</b>				
2.0GIG	Archive Pythion	4mm	\$979	\$999
3-5GIG	Archive Turbo DAT*	4mm	\$1229	\$1249
2.0GIG	WangDAT 3100	4mm	\$999	\$1019
3-5GIG	WangDAT 3200*	4mm	\$1079	\$1099
2.0GIG	HP 35470A	4mm	\$1179	\$1199
3-5GIG	HP 35480A*	4mm	\$1279	\$1299

## 8MM TAPE BACKUP SYSTEMS

2-5GIG	Exabyte 8205	8mm	\$1655	\$1675
5-10GIG	Exabyte 8505	8mm	\$2609	\$2629

Includes Retrospect v2.0 Backup Software, One Tape &amp; ONE Year Warranty. \* Data Compression.

**MIGHTY SO**  
**3.5" 105MB**


## FEATURING


**SyQuest®**  
**REMOVABLE TECHNOLOGY**

SyQuest Drives include a TWO Year Warranty, one cartridge &amp; necessary cables, SCSI Director™ Formatting Utility - SyQuest Cartridges carry a ONE Year Warranty.

## CLUBMAC 3.5" 105MB REMOVABLES

ClubMac 105mb External (SQ1055)	\$599
ClubMac 105mb Internal (Q900/950)	\$569

## CLUBMAC 88C REMOVABLES\*

ClubMac 88c External (SQ5110C)	\$499
ClubMac 88c Internal	\$469
ClubMac 88c Dual	\$929

\* ClubMac 88c will read and write 44mb cartridges, but will not format 44mb cartridges.

## CLUBMAC 44MB REMOVABLES

ClubMac 44mb External (SQ555)	\$329
ClubMac 44mb Internal	\$289
ClubMac 44mb Dual	\$589

## CLUBMAC 88MB REMOVABLES

ClubMac 88mb External (SQ5110)	\$445
ClubMac 88mb Internal	\$415
ClubMac 88mb Dual	\$799

## REMOVABLE CARTRIDGES

105mb / 44mb / 88mb Cartridge \$59 / 59 / 96

**399**  
 MultiSpin 74-1


## CD-ROMs Solutions

ClubMac External CD-ROM-S \$425

(based on Sony CDU561 mechanism) 375ms Access Time

ClubMac External CD-ROM-T \$489

(based on Toshiba 3401B mechanism) 200ms Access Time

**NEC**

NEC CD-ROMS carry a TWO Year Warranty.

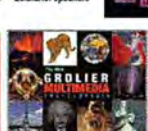
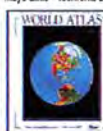
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NEC MultiSpin 74-1 280 ms Access Time ..... \$399 \$499

NEC MultiSpin 38 480 ms Access Time ..... \$269 \$369

## CLUBMAC CD BUNDLE OVER \$800 VALUE

Animals • World Atlas • Maya Clinic • Toolworks Encyclopedia • US Atlas • Lucas Game Pack II • QuickShot Speakers


**LUCASFILM**  
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## ClubMac OPTICAL Drives


**FUJITSU**  
**128MB DYNAMO**  
**\$929**

**TEAC 3.5"**  
**128MB EXTERNAL**  
**\$799**

**SHARP 5.25"**  
**650MB EXTERNAL**  
**\$1829**

Model	Capacity	Description	Seek	Internal	External
DynaMo	Fujitsu	128mb	3.5" Low Profile	35ms	\$929
CMO-M2511A	Fujitsu	128mb	3.5" Low Profile	35ms	\$899 \$929
CMO-3D3000	Teac	128mb	3.5" Half Height	45ms	\$769 \$799
CMO-OMD5010	Epson	128mb	3.5" Half Height	45ms	\$899 \$929
CMO-3100E	Ricoh	128mb	3.5" Half Height	45ms	\$899 \$929
CMO-JY750	Sharp	594/652mb	5.25" Half Height	40ms	\$1799 \$1829
CMO-5031E	Ricoh	594/652mb	5.25" Full Height	28ms	\$2249
CMO-Tahiti II	MaxOptix	650/1.0GIG	5.25" Full Height	35ms	\$2899
128mb / 594-652mb / ZCAV Cartridge for MaxOptix					\$39 / 99 / 175

All ClubMac Opticals include ONE cartridge and ONE Year Warranty.



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1-800-CLUBMAC

1-800-258-2622

### E-Machines T16 II

• 640 x 480 up to 1024 x 768  
• Comp. with on-board graphics on the Quadra and Centris

**\$1259**

MacUser Magazine January 1993

### E-MACHINES

#### E-MACHINES MONITORS

ColorPageT16II / E-Machines T20XL	\$1259 / 2519
E-Machines E20 Dual Mode Color Display	\$1635
E-Machines T20 Multi-Mode Color Display	\$2495

#### E-MACHINES GRAPHIC CARDS

24-Bit Futura SX / MX	\$355 / 799
24-Bit Futura II SX / LX NEW!!	\$429 / 775
24-Bit Ultra LX NEW!!	\$1619

**\$879**

### RASTEROPS

#### SWEET 16 MONITOR

832 x 624 resolution at 75 Hz. Comp. cards: ProColor 32, 24XII, PB Li, 8XLI, 24MxQ, 24Mx

MacUser Magazine January 1993 Rasterops Sweet 16

#### GRAPHIC CARDS

24Mx / 24MxQ	\$599 / 1165
24XLI / 24X	\$1869 / 599
PaintBoard Turbo / Li	\$1159 / 779
8XLI / 8XL	\$899 / 459
ColorBoard 264/SE30	\$459

### SUPERMAC™

#### MONITORS

SuperMac High Res 20"	\$2749
SuperMatch 21"	\$2379
SuperMatch 20T Multimode XL	\$2539
SuperMatch Plus 20" Color	\$1649
SuperMatch 17T	\$1049

#### MULTIMEDIA

Video Spigot NuBus / Pro NuBus	\$365 / 999
Spigot & Sound NuBus / Pro NuBus	\$479 / 1125

#### 24-BIT GRAPHIC CARDS

Thunder/24	\$2159
ThunderLight	\$1669
Spectrum/24 PQD Plus / Series IV	\$1459 / 789

#### 8-BIT GRAPHIC CARDS

Thunder/8	\$1129
Spectrum 8-24 PQD / PQSi	\$759

#### ACCELERATORS

ThunderStorm / Deluxe	\$599 / 829
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### MONITORS

21" Color Monitor (2168)	\$2295
20"/20T Multiscan Monitor (2075R0)	\$2499
20/20 Multiscan Color Monitor (2020C)	\$1529
21" Mono/GrayScale Monitor (2110)	\$995
15" ClearVue/15 Portrait (1510)	\$399

### MULTIMEDIA

MoviePak	\$749
MoviePak with Adobe Premiere	\$1129
MediaTime	\$1485
24XLTV / 24MXTV / 24STV	\$2599 / 1639 / 745

### BUY A NEC 6FG WITH A MACFG 24X & GET A MULTISPIN 74-1 FREE

**\$2349** NEC 6FG

**\$1199** MACFG 24X

**FREE** MULTISPIN 74-1

\*Purchase a NEC 6FG with a MacFG 24X and get a NEC Multispin 74-1 from NEC, via mail-in coupon, offer ends 12/31/93

#### MONITORS

15" MultiSync 3FGe	\$599
15" MultiSync 4FGe	\$719
17" MultiSync 5FGe	\$1095
17" MultiSync 5FG	\$1299
21" MultiSync 6FG	\$2349
MacFG 24X / 24Xp	\$1199 / 495

#### PRINTERS

Silentwriter 1097	\$1439
Silentwriter 95f	\$899
Silentwriter 97	\$1119
Silentwriter 95fx	\$1139
Silentwriter 97fx	\$1349

**\$899** Silentwriter 95f

### radius

#### MONITORS

Color Display/21	\$2319
IntelliColor Display/20	\$2589
PrecisionColor Display/20v	\$2299
PrecisionColor Pivotal	\$929
Pivotal Display/E	\$579
Full Page Display	\$469
Two Page Display (m/19)	\$665
Two Page Display (m/21)	\$819
Two Page Display (m/21E)	\$1099

#### GRAPHIC CARDS

PrecisionColor Pro 24X	\$2079
PrecisionColor Pro 24XP	\$499
PrecisionColor 24X	\$1479
PrecisionColor 24XP	\$425
PrecisionColor 24XK	\$815
PrecisionColor 8XJ	\$489
Color Pivot/Pivotal	\$485 / 249
FPD / TPD	\$189 / 375

#### MULTIMEDIA

VideoVision Studio	\$3689
VideoVision Studio Upgrade	\$1629
VideoVision (Presentation)	\$1949
VideoVision (Basic)	\$1625
Rocket 25i / 33	\$979 / 1449
RocketShare	\$399
SCSI-2 Booster	\$249

### GLOBAL VILLAGE POWERPORT (for PowerBooks)

Bronze / Silver / Gold	\$165 / 319 / 369
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### GLOBAL VILLAGE TELEPORT (External Desktop)

Bronze / Silver / Gold	\$175 / 319 / 375
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### PSI MODEMS

PowerModem I / II / III / IV	\$119 / 225 / 319 / 359
Constellation I / Constellation V	\$135 / 429

### SUPRA MODEMS

SupraFaxModem 14.4 LC V.32bis, V.42bis w/FAXset & Micro	\$165
SupraFaxModem 14.4 V.32bis, V.42bis Standalone	\$235
SupraFaxModem 14.4 V.32bis, V.42bis w/FAXset & Micro	\$289
SupraFaxModem PB 14.4 V.32bis, V.42 Internal for PB	\$299
SupraFaxModem PB + 14.4 V.32bis, V.42bis, VOICE Int for PB	\$395
Supra 2400 Baud External Modem	\$69

### MODEMS

**\$229**

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ActionScan	\$799
Epson ES-600 Scanner with PhotoShop 2.5 LE, and ScanTastic (PhotoShop Plug-In)	\$1379

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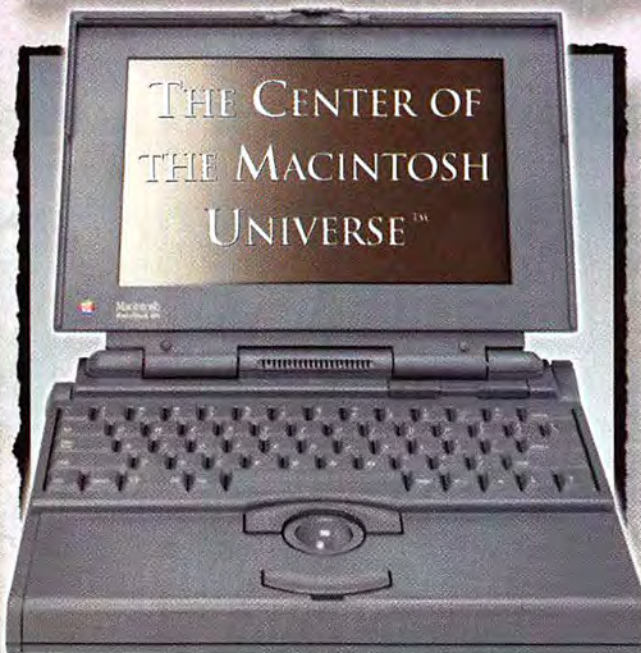
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600, 800, or 1200 dpi color scanners with 51 brightness and contrast levels. Scans flat art in an 8-1/2 x 14" viewing area. Includes full version of Adobe Photoshop. Transparency Option allows scanning of flat art, transparencies, and slides in a 6 x 9" viewing area.

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UC 630 Color Transparency Option **689**  
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UC 840 Color Transparency Option **699**

UC 1260 Color Scanner **\$1879**  
**RealTech Scan 800 with Transparency Option**

#### RealTech Scan 800

800 dpi color scanner with 200 brightness and contrast levels. Scans flat art in an 8-1/2 x 11-3/4" viewing area. Optional Adobe Photoshop: \$200. Includes ScanMatch color calibration software. Transparency Option allows scanning of flat art, transparencies, and slides in an 8-1/2 x 11-3/4" viewing area.

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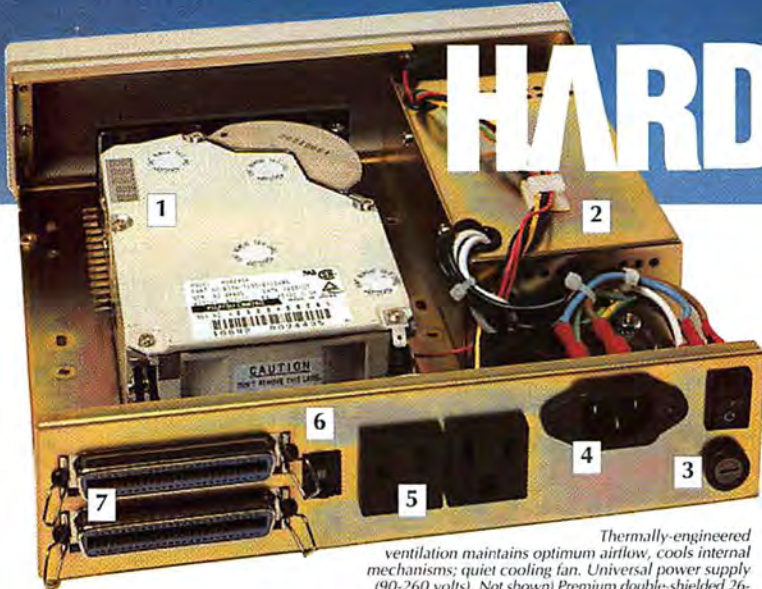
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<b>170 - 260 MB</b>								
Quantum 170	ELS170	\$259	\$329	160	17	1.4	LP	2
Quantum 240	LPS240	339	409	234	10	1.4	LP	2
Maxtor 245	7245	279	349	245.6	15	3.0 <sup>1</sup>	LP	2
<b>345 - 700 MB</b>								
Maxtor 345	7345	\$449	\$519	345	15	3.0	HH	2
Fujitsu 520	M2624FA	799	869	496	9	2.7 <sup>1</sup>	HH	5
Quantum 525	LPS525	679	749	525	10	2.9 <sup>1</sup>	LP	2
Maxtor 540	MXT-540	839	909	521	9	5.5 <sup>2</sup>	HH	2
Conner 540	CP-3540	899	969	515	12	5.5 <sup>2</sup>	HH	1
Micropolis 680	M2205	909	1009	585	10	5.0 <sup>2</sup>	FH	5
Quantum 700	PRO700	1199	1269	670	10	2.9 <sup>1</sup>	HH	2
<b>1.0 MB - 1.3 GB</b>								
Quantum 1050	PRO1050	\$1009	\$1079	1000	10	2.9 <sup>1</sup>	HH	2
HP 1050	97558	1649	1749	987	13.5	2.8 <sup>1</sup>	FH	5
Fujitsu 1.2	M2266	1249	1349	1079	14.5	3.0 <sup>1</sup>	FH	5
Micropolis 1.225	M2110	1139	1239	1056	10	5.0 <sup>2</sup>	FH	5
Maxtor 1.24	MXT-1240s	1359	1429	1240	9	4.5 <sup>2</sup>	HH	3
<b>1.7 - 3.6 GB</b>								
Micropolis 1.7	M2217	\$2049	\$2019	1750	10	5.6 <sup>2</sup>	FH	5
Micropolis 2.5	M1926	2219	2319	2158	13	4.8 <sup>2</sup>	FH	5
Micropolis 3.6	M1936	2799	2899	3022	10	6.0 <sup>2</sup>	FH	5

\* Transfer rate (or throughput) depends on your Mac CPU and system configuration. For more information, ask your Hardware That Fits sales partner. \*\* Form Factor Low Profile (LP)=3.5 Half Height (HH)=3.5 Full Height (FH)=5.25

<sup>1</sup> SCSI-2 <sup>2</sup> SCSI-2 Fast These drives are most efficient when used with a Macintosh Quadra 800 or 950.

## REMOVABLES

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TEAC 600 MB Drive .....699

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1.2GIG	3.5"	8.5MS	\$ 969	\$ 1019
2.4GIG	5.25"	11.5MS	\$ 1765	\$ 1865

### Seagate 5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	INTERNAL	EXTERNAL
283MB*	3.5"	16MS	\$ 339	\$ 399
344MB	3.5"	12MS	\$ 451	\$ 511
600MB*	3.5"	10.5MS	\$ 889	\$ 949
1.2GIG	3.5"	9MS	\$ 995	\$ 1059
1.6GIG*	5.25"	15MS	\$ 1289	\$ 1348
2.2GIG*	5.25"	12MS	\$ 1589	\$ 1689
2.4GIG	5.25"	11MS	\$ 1935	\$ 2035
2.5GIG	3.5"	8MS	\$ 2229	\$ 2289
3.4GIG	5.25"	10MS	\$ 2390	\$ 2490

### HITACHI 5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	INTERNAL	EXTERNAL
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1.6GB	3.5"	11.8 MS	\$ 1539	\$ 1599
3.7GIG	5.25"	12.8 MS	\$ 2789	\$ 2889

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- Fast SCSI II Interface
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500MB	Sankyo CP-525	DC6250	\$ 565	\$ 625
1.3-2GIG	Archive 4320*	4MM	\$ 1109	\$ 1149
1.3-8GIG	Archive Turbo*	4MM	\$ 1299	\$ 1359
1.3-2GIG	Exabyte 4200*	4MM	\$ 999	\$ 1059
1.3-5GIG	Exabyte 8205	8MM	\$ 1506	\$ 1659
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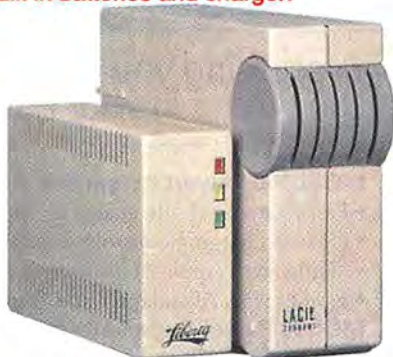
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## Both drives have 525 MB, but the little one has MORE...

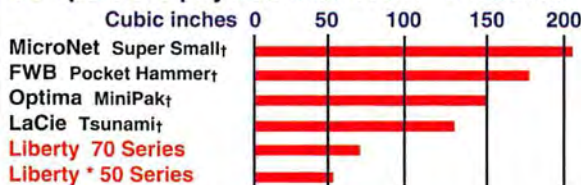
... it has: Built in batteries and charger!



"The portables are drives small enough to slip into a briefcase without squishing your peanut butter and jelly sandwich. Liberty's design is the hands-down winner in this category."  
MacWorld Mar. 93



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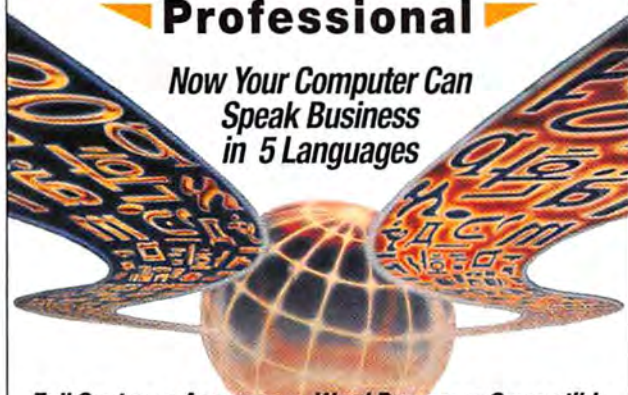
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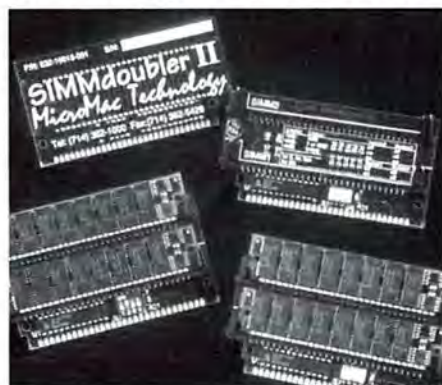


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Source: MacUser 1992 Study of Microcomputer Product Ownership and Buying Plans

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Platinum 21 Two-Page Display (9761)	\$999

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Fujitsu drives carry a FIVE Year Warranty.			
		Internal	External
425MB	M2623FA 3.5" HH	9ms	\$839 \$899
520MB	M2624FA 3.5" HH	9ms	\$889 \$949
1.2GIG	M2266 5.25" FH	14ms	\$1325 \$1425
2.0GIG	M2652 5.25" FH	14ms	\$2275 \$2375
2.4GIG	M2654 5.25" FH	11ms	\$2489 \$2589

**Conner**

Conner drives carry a ONE Year Warranty.			
85MB	CP30080E3 5" LP	17ms	\$194 \$254
170MB	CP30170E3 5" LP	17ms	\$274 \$334
212MB	CP30200 3.5" LP	12ms	\$359 \$419
520MB	CP30540 3.5" HH	10ms	\$880 \$939

**Quantum**

ELS, LPS, PRO drives have a TWO Year Warranty  
Go-drives have ONE Year Warranty

42MB	ELS42	19ms	\$169 \$229
85MB	ELS85	17ms	\$195 \$255
127MB	ELS127	17ms	\$249 \$309
170MB	ELS170	17ms	\$275 \$339
240MB	LPS240	10ms	\$355 \$445
425MB	PRO425	9ms	\$849 \$919
525MB	LPS525	10ms	\$895 \$969
700MB	PRO700	10ms	\$1179 \$1239
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1.2GIG	PRO1225	10ms	\$1499 \$1549

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**NEC CD-ROM**



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MC+IE64 Thick/Thin, 64K	\$159
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**Mac Ili & SE/30 (80030 PDS)**

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**MC+30IE64 Thick/Thin/64K, FPU Socket**

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PB140/170-6MB .....	289
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PBDUO210/230-6MB .....	284
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Conner 540	599	659	"AS NEW" Ext.	new product.
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340MB	15ms	3600	Maxtor	2 Years	\$339	\$399
340MB	13ms	4011	Conner	2 Years	\$369	\$429
520MB	12ms	4400	Fujitsu	5 Years	\$639	\$699
525MB	10ms	4500	Quantum	2 Years	\$589	\$649
540MB	10ms	5400	Conner	2 Years	\$619	\$679
540MB	8.5ms	6300	Maxtor	3 Years	\$759	\$829
560MB	10ms	5400	Micropolis	5 Years	\$725	\$795
700MB	10ms	4500	Quantum	5 Years	\$749	\$809
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2Gig	DAT	Hewlett Packard	12MB/min	\$999	\$1019
4-8Gig	DAT	Archive	88MB/min	\$1209	\$1229
4-8Gig	DAT	Hewlett Packard	42MB/min	\$1179	\$1199
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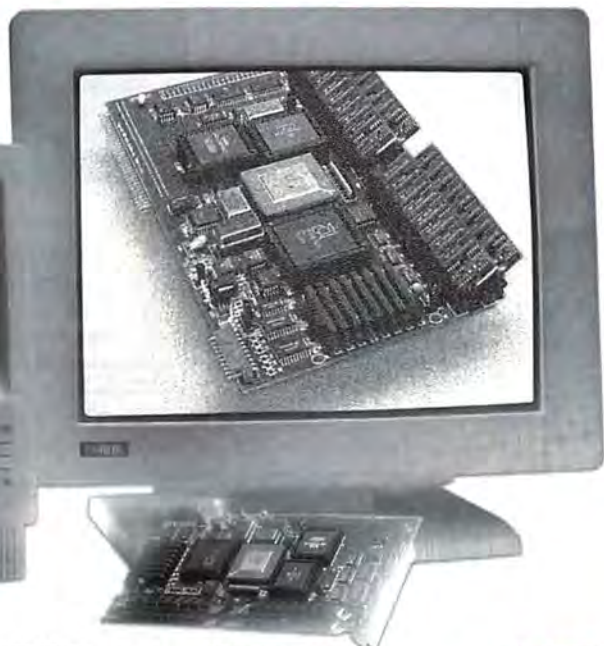


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# Boston Crab Apples



**Rumors of Apple's impending demise are greatly exaggerated.**

Last August, I meandered over to the Boston Macworld Expo to find out what was new in the world of Macintosh computing. I'd say it was pretty ordinary as such shows go — with one important exception.

First, to answer the perennial trade-show question, what was hot? For one thing, video-editing products, both hardware and software, seemed to be everywhere. And one company, LaserMaster, had an inkjet printer called the DisplayMaker that produced huge Kodachrome-quality posters and transparencies. Unfortunately, its \$20,000 price tag makes the DisplayMaker suitable only for service bureaus and big agencies.

Not surprisingly, I also saw better games than ever before and plenty of cool peripherals. Lots of people were talking about Live Picture, a new imaging application that uses "revolutionary" FITS technology. So revolutionary the product will cost only \$3,500! Maybe they can work out a deal to bundle a Mac with each copy.

In other words, it was a typical show, with the usual mixture of hype and hoopla. What wasn't typical was the gloomy mood of the Mac community.

You see, right before this show opened, Apple's stock took one of its periodic nosedives. All of a sudden, people with short memories seemed ready to write the company off. One well-known writer actually said to me, "Gee, it has the feeling of the end. You can sense that this is the end of the road for the Mac."

## Mac Bashers

It was a former publisher of *PC Magazine*, of all people, who asked me why so many people were bashing the Mac and Apple. I replied that ever since the late '70s, analysts have been convinced that Apple would never turn the next corner. When Apple was a half-billion dollar company, the experts said it was curtains. Then they said Apple could never make it past the billion-dollar stage. Then Apple was going under when it made \$2 billion. The company was sinking fast at \$3 billion. Down for the count at \$4 billion. You get the idea.

I went on to say that Apple will go through a transition period as it migrates from the 68000 family of processors to the PowerPC chip that it developed jointly with IBM and Motorola. This process may take a couple of

years, and it might temporarily slow Mac sales as people hold off buying while they wait for what is clearly a radically superior technology. Long-term, though, things couldn't be rosier for Apple. "Well, why is everyone bashing the Mac so fiercely?" was the response. "Do they want to kill their own preferred platform? It makes no sense!" No kidding. Because I'm *paid* to complain, I hadn't until then noticed how loud the bitching and moaning had become in the Mac community. It was unusual, for sure.


I thought about this for a long time in an effort to make some sense of it. Perhaps it's a natural psychological reaction. Maybe we're going through predeath grieving and will continue to be morose until the 68000-based Mac is no longer in production and we can have a true, celebratory New Orleans-style wake for old Betsy. Until then, we'll worry incessantly about the future. About whether the transition to PowerPC will work. And even about whether Apple Computer will survive at all.

## Newton in Town

The one technology the show did seem excited about was the Newton. People waited in long lines on the show floor for the privilege of buying one. Of course, by the next day, all you heard were complaints about Newtons crashing and rumors that Apple was already set to recall the first-shipment units for ROM fixes.

Hold on — wasn't this supposed to be a Mac show? What was the Newton even doing there? The Newton's not a Mac. Apple did release some *real* Macs at the show (the Quadra 840AV and the Centris 660AV), and they are actually pretty cool boxes. Why weren't there lines around the block to buy those? No wonder people were in a bad mood. It's as if their beloved Mac was being snubbed. The Newton is the hot new thing of the present, and the PowerPC is the hot new thing of the future — the chip that will "save" the Mac. But wait, now the Mac needs *saving*?

Then again, it may have been Boston's 95-degree heat and 95-percent humidity that caused all the grumbling. Let's give it a year and see what happens before we all jump to conclusions.

Bottom line: The Mac ain't dead yet. Don't forget, the PowerPC *is* a Mac. Besides, if Apple went under, what would I have left to complain about? 





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